# KS2 Maths
# SATs Practice Workbook

Ages 10-11

# REASONING

BOOK 1

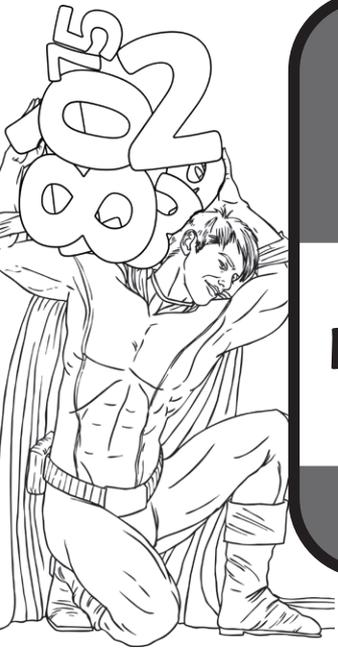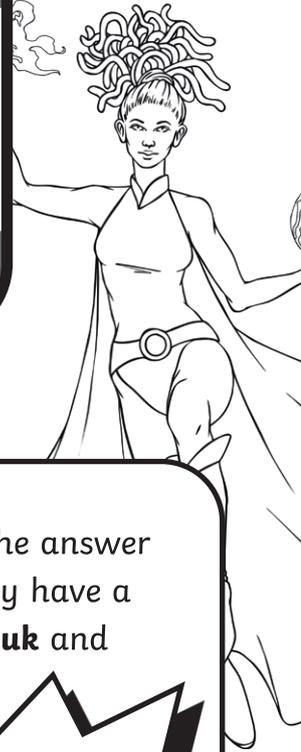With interactive games and linked explainer videos.

Name:

twinkl

**Boost test confidence and results with our curriculum-aligned bite-sized revision.**
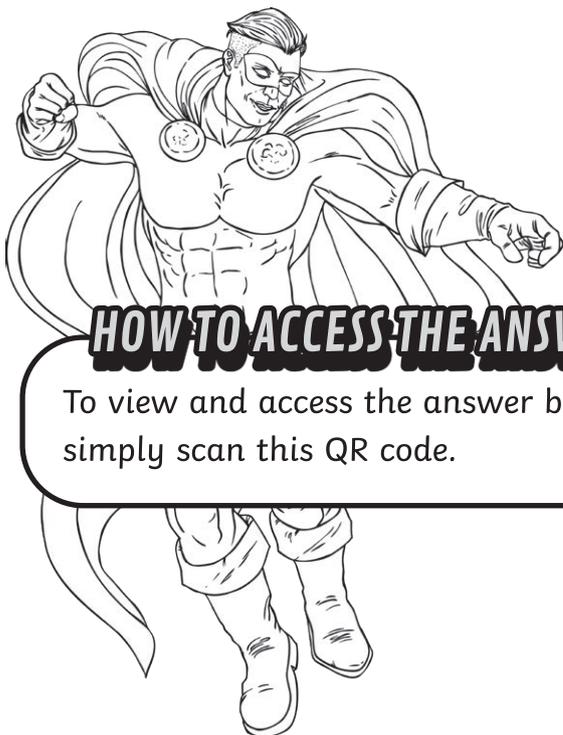
# STUDY SQUAD

**Name:**

## NEW RECRUIT

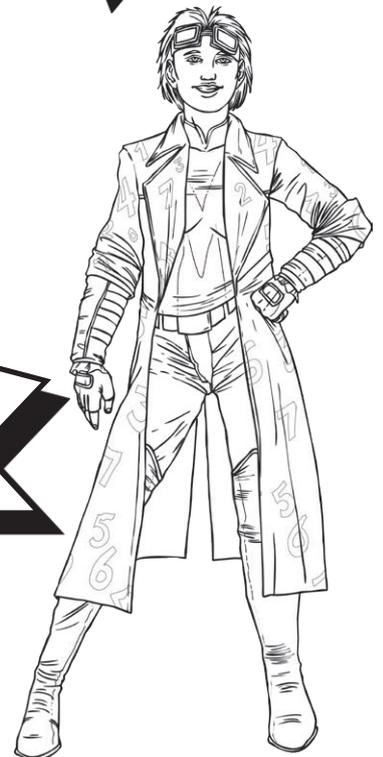## HOW TO ACCESS THE VIDEOS AND GAMES

To view and access the concept revision videos, interactive Go! Games and the answer booklet, your adult will need a **Twinkl account**. If your adult doesn't already have a Twinkl account, they can create a **free account** by going to **www.twinkl.co.uk** and selecting **'Join'** in the top right-hand corner.

The QR codes throughout the workbook are a great way of accessing the interactive activities but you can also find them on the Study Squad page. Simply scan this QR code to explore the whole **Study Squad range.**

## HOW TO ACCESS THE ANSWERS

To view and access the answer booklet, simply scan this QR code.

# CONTENTS

# STUDY SQUAD

Each of the **Maths Heroes** has a superpower relating to a particular unit of maths. Together, they will guide you through the concepts in this workbook.

**THE FRACTION FLAME**

**THE RATIO RESCUER**

**AGENT ALGEBRA**

**DOCTOR DIGIT**

**CAPTAIN CALCULATION**
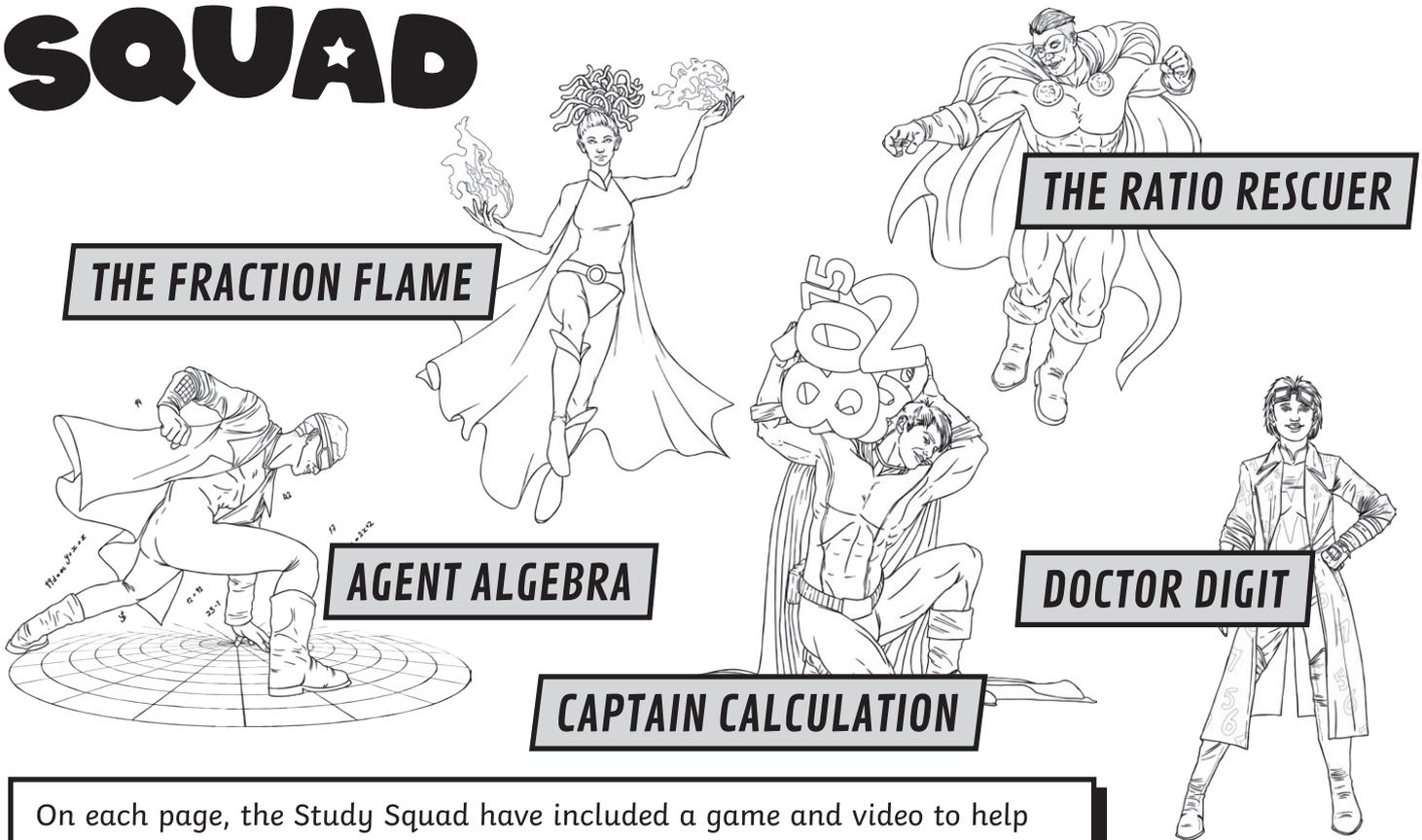
On each page, the Study Squad have included a game and video to help you boost your maths superpower. Scan the QR codes, using a device with a camera and internet access, to continue your hero training.

You'll get to know the **Study Squad** children as they pop up throughout the workbook.

FELIX

DREW

JIA

EMILY

ELENA

ABI

ELIAS

BARTEK

JOSEPH

AMRIT

PRIYA

ZEKE

HARI

# SELF-REFLECTION INSTRUCTIONS

After each concept, you will have the opportunity to reflect on your understanding. Once you have answered all of the questions, colour or shade in the superhero next to the statement that you most agree with.

At the end of each concept, use the self-reflection to review which areas you found trickier than others. This will give you an idea of which areas you need support with and which areas you are more confident with.

Ready for your first maths mission?
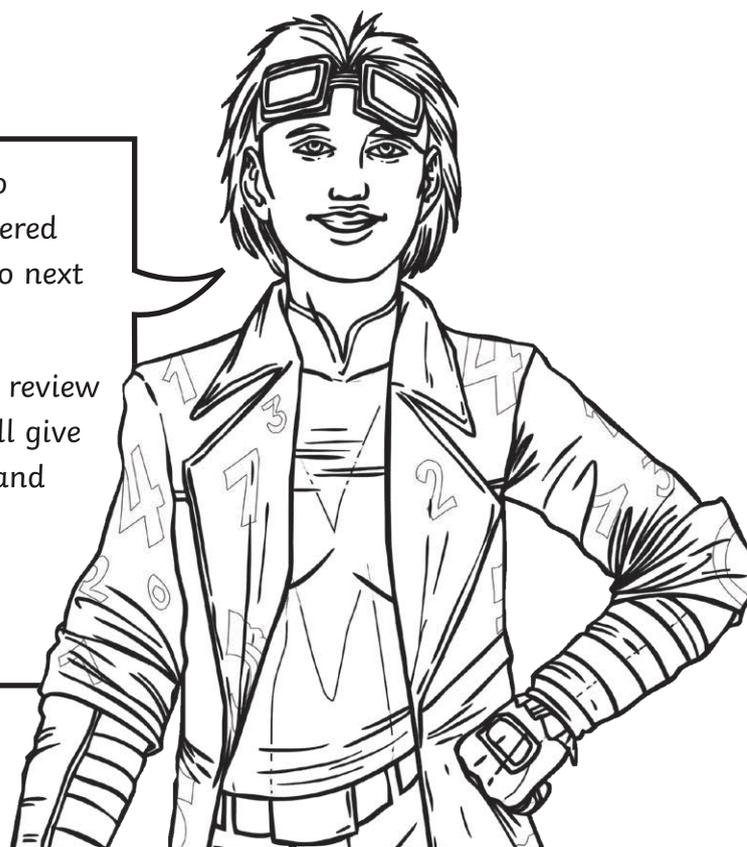
## I DON'T UNDERSTAND THIS YET!
I found this tricky. I need support with this.

## I MOSTLY UNDERSTAND THIS!
I can do this mostly but sometimes I need support. I may need some more practice.

## I COMPLETELY UNDERSTAND THIS!
I can do this by myself. I could explain how to solve these questions to someone else.

## SUPERCHARGE!

SCORE: ☐ /4

True or false?

a) 1 903 768 in words is ninety hundred thousand, three thousand, seven hundred and sixty-eight.

_____

b) 558 in Roman numerals is DLVIII.

_____

c) $4.5 + 0.2 > 5.2 + 0.5$

_____

d) $6^2 + 2^3 < 2^2 \times 10$

_____

a) False  b) True  c) False  d) False

## BOOST YOUR SUPERPOWERS

All numbers are made up of **digits**. We need to know the **place value** of each digit to read and write large numbers.

The value of a digit becomes **ten times greater** as its place value position moves to the left.

| | |
|---:|:---|
| 1 | **ones** |
| 10 | **tens** |
| 100 | **hundreds** |
| 1000 | **thousands** |
| 10 000 | **ten thousands** |
| 100 000 | **hundred thousands** |
| 1 000 000 | **millions** |
| 10 000 000 | **ten millions** |

REVISION VIDEO
SCAN ME
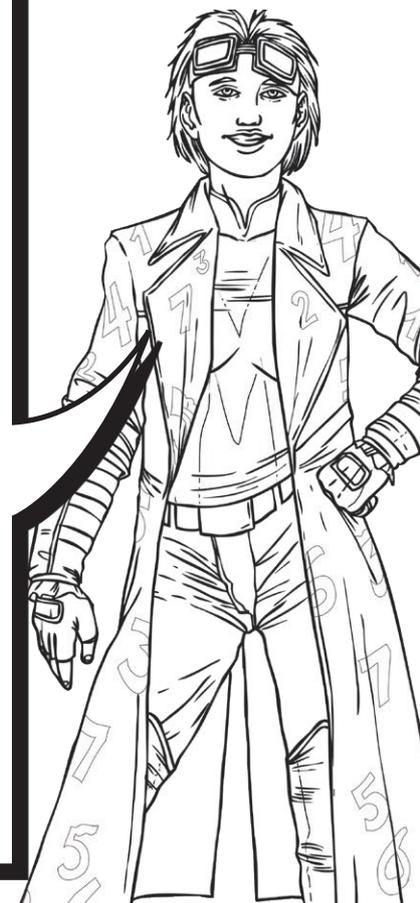
**1** Write the number **932 407** in words.

_____

1 mark

**2** Look at the number **36 974 082.**

a) Which digit is in the ten thousands column?

1 mark

b) Which digit is in the millions column?

1 mark

**3** Write the number that is four thousand **less than** two million.

1 mark

**4** The numbers in this sequence **decrease** by the same amount each time.

1 827 921      1 817 921      1 807 921      1 797 921

What number would come next in the sequence?

1 mark

**5** Felix has written the number **16 100 439** in words.

**sixteen million, one hundred and forty-three thousand and nine**

**Explain** the mistake that Felix has made.

1 mark

**6** Here are four digit cards.

| 5 | 7 | 1 | 3 |
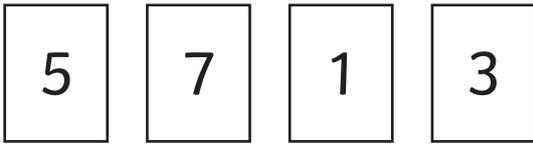
Elena uses each card once to make a **four-digit** number.

Elena places:

- 3 in the tens column;

- 1 so that it has a lower value than any of the other digits;

- the remaining two digits so that 7 has the higher value.

Write a digit in each box to show Elena's number.

☐ ☐ ☐ ☐

1 mark

/7

**TOTAL**

# MISSION COMPLETE!



### How confident do you feel?

# INTERACTIVE GAME

Scan this QR code to access a Twinkl Go! Game to further practise your maths skills.

**SCAN ME**

# NOTES

# WORKING OUT

# COMPARING AND ORDERING POSITIVE INTEGERS

## SUPERCHARGE!

Compare the following numbers with one of these symbols: **<** , **>** or **=**.

a) 4807 ☐ 4708

b) 2672 ☐ 2627

c) 1907 ☐ 1907

d) 3235 ☐ 3325

e) 7436 ☐ 7346

f) 5919 ☐ 5991

Answers: a) > b) > c) = d) < e) > f) <

## BOOST YOUR SUPERPOWERS

When **ordering** or **comparing** numbers, we compare the place value of the digits in each number, starting with the digits in the **largest place value** column on the far left.

If the numbers have the **same digit** in a place value position, we look at the digits in the place value column to the **right** until we find a **difference**. We can use the symbols **< (less than)** and **> (greater than)** to compare numbers.

34 **8**71 243 **>** 34 **7**18 432 **<** 34 **8**71 243

| Millions | | | Thousands | | | Ones | | |
|---|---|---|---|---|---|---|---|---|
| H | T | O | H | T | O | H | T | O |
| | 3 | 4 | **8** | 7 | 1 | 2 | 4 | 3 |
| | 3 | 4 | **7** | 1 | 8 | 4 | 3 | 2 |
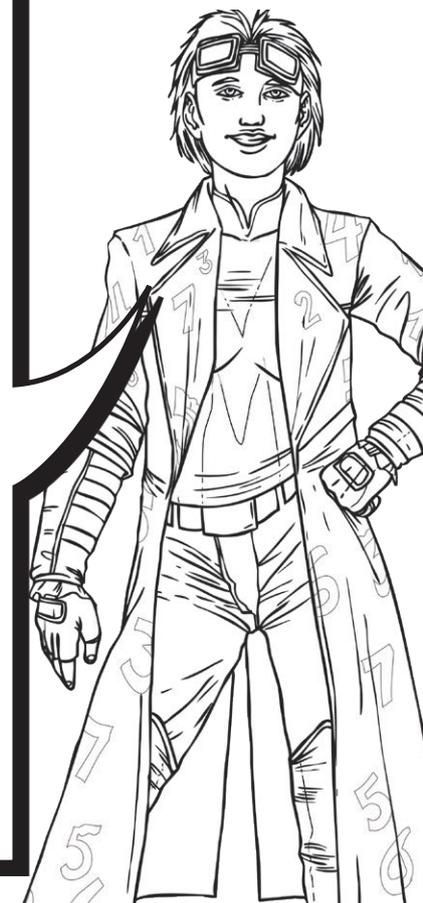
**1** Circle the greatest number.

6 348 032    6 436 899    6 386 351    6 437 101    6 340 832

*1 mark*

**2** Write the smallest and greatest possible numbers that can be used in these comparisons.

323 719 < ☐ < 332 719

a) smallest: ☐

b) greatest: ☐

*1 mark*

7 091 910 < ☐ < 7019 109

c) smallest: ☐

d) greatest: ☐

*1 mark*

**3** Order the numbers starting with the **largest**.
Match each number with its order.

6 570 481                    1st  largest

6 075 481                    2nd

6 750 481                    3rd

6 057 481                    4th  smallest

*1 mark*

**4** Write a digit in each box so that the numbers are written in order, from **smallest to largest**.

a)  5 62 ☐ 073          smallest

b)  5 628 ☐ 46

c)  ☐ 937  348

d)  6 ☐ 42 763

e)  6   042  76 ☐          largest

3 marks

**5** Drew says,

DREW

94 672 is greater than 801 213 because 9 is greater than 8

**Explain** why Drew is **not** correct.

1 mark

/8

**TOTAL**

## MISSION COMPLETE!

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# INTERACTIVE GAME

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# NOTES

# WORKING OUT
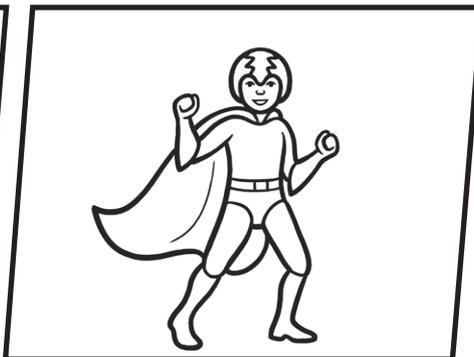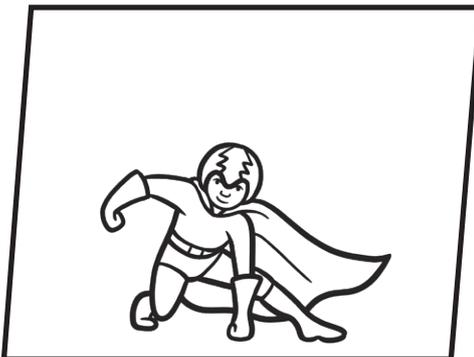
# NEGATIVE INTEGERS

## SUPERCHARGE!

SCORE: ☐ /4

Each emoji represents a number. Calculate the number that each emoji represents.

a) 😃 + 11 = 6

b) -7 + 😂 = 15

c) -2 – 😆 = -9

d) 😋 + 11 = -5

a) 😃 = ☐    b) 😂 = ☐

c) 😆 = ☐    d) 😋 = ☐

Answers: a) -5    b) 22    c) 7    d) -16

## BOOST YOUR SUPERPOWERS

Negative numbers are numbers **below zero**. They are expressed with a negative sign before the number. The **negative sign tells you how far away a number is from zero**. -6 is six steps away from zero.

When solving a problem that involves crossing zero, it can be useful to draw a number line.

50 — 40 — 30 — 20 — 10 — 0 — -10 — -20 — -30 —    °C

**-10 + 12 = 2**

+ 10          + 2

-10            0          2

SCAN ME
REVISION VIDEO
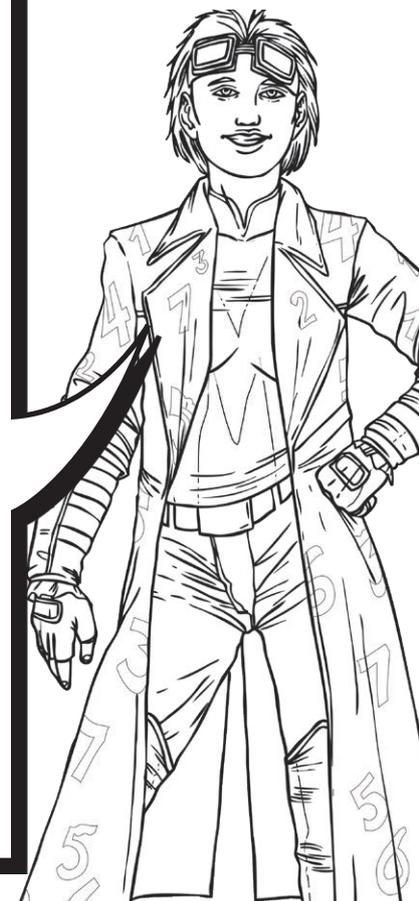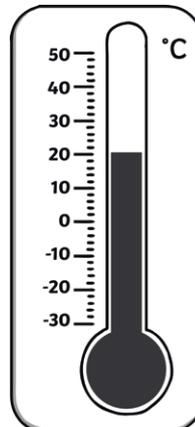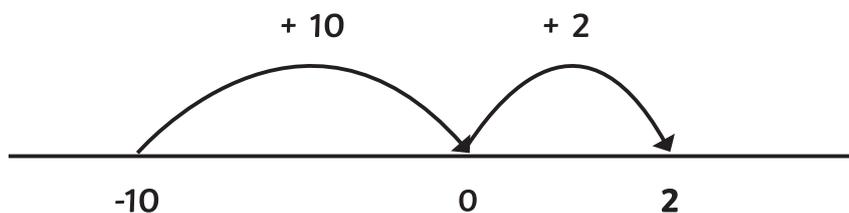
**1** Here is part of a number line.

Write the missing numbers in the boxes.

+ 5          + 8

a) [ ]          -6          b) [ ]
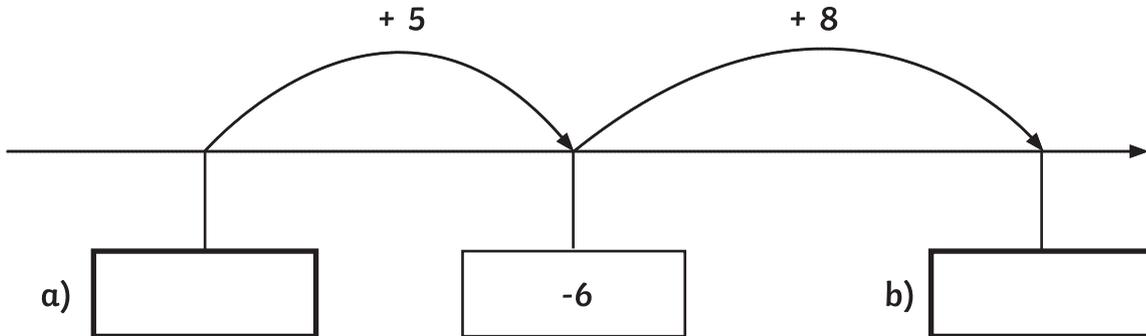
**2 marks**

**2** Here is a sequence of numbers. The rule is to **subtract** the **same amount** each time.

Write in the missing numbers.

| 22 | | | | | -3 |

**1 mark**

**3** Here are the temperatures, at the superhero hideouts, at 9 a.m. and 9 p.m.

| Hideout | Temperature | |
|---|---|---|
| | 9 a.m. | 9 p.m. |
| Ice Caves | -7°C | -15°C |
| Fire Cavern | 34°C | 11°C |
| Plasma Palace | -5°C | 9°C |
| Hero Hideaway | -1°C | 3°C |

a) How much **colder** were the **Ice Caves** than the **Fire Cavern at 9 a.m.**?

[ ] °C

**1 mark**

b) Which city was **4 degrees hotter** at 9 p.m. than 9 a.m.?

[ ]

**1 mark**

**4** The superheroes are building a new tower hideout.

Doctor Digit says,

> If we build a floor on every level from level -5 to level 20, the tower will have 25 floors in total.

Do you **agree** or **disagree** with Doctor Digit?

**Explain** your answer.

Agree / Disagree

1 mark

/6

**TOTAL**

# MISSION COMPLETE!

How confident do you feel?

# INTERACTIVE GAME

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**SCAN ME**

# NOTES

# WORKING OUT
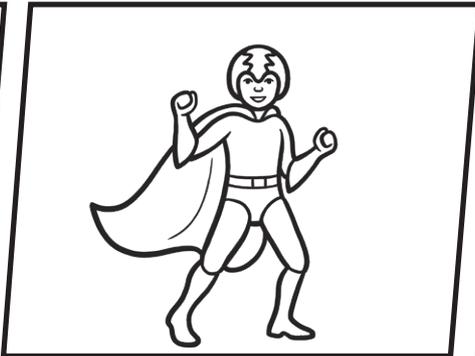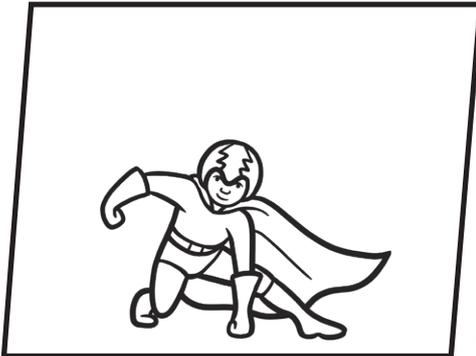
# COMPARING AND ORDERING DECIMALS

## SUPERCHARGE!

SCORE: [ /5 ]

Use **addition** and **subtraction** calculations to complete the pyramid so that each box is equal to the **sum** of the two numbers directly below it.

```
              ┌──────────┐
              │ d)       │
        ┌─────┴────┬─────┴────┐
        │ 0.6      │ c)       │
   ┌────┴─────┬────┴─────┬────┴─────┐
   │ 0.32     │ b)       │ 0.12     │
┌──┴────┬─────┴────┬─────┴────┬─────┴────┐
│ 0.15  │ 0.17     │ a)       │ 0.01     │
└───────┴──────────┴──────────┴──────────┘
```
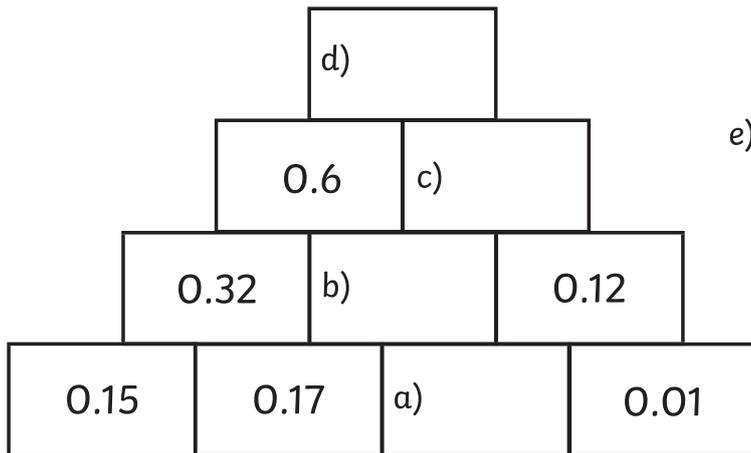
e) What is the total of the answers to parts a, b, c and d? [      ]

**Answers: a) 0.11 b) 0.28 c) 0.4 d) 1 e) 1.79**

## BOOST YOUR SUPERPOWERS

To compare decimal numbers, you must look at the place value of each digit in turn, starting with those on the far left as they have the **greatest value**. If the numbers have the **same digit** in a place value column, we look at the digits in the place value column one place to the **right** until we find a **difference**.

| | 27.91 > 27.19 | | |
|---|---|---|---|
| Tens | Ones | tenths | hundredths |
| 2 | 7 | **9** | 1 |
| 2 | 7 | **1** | 9 |
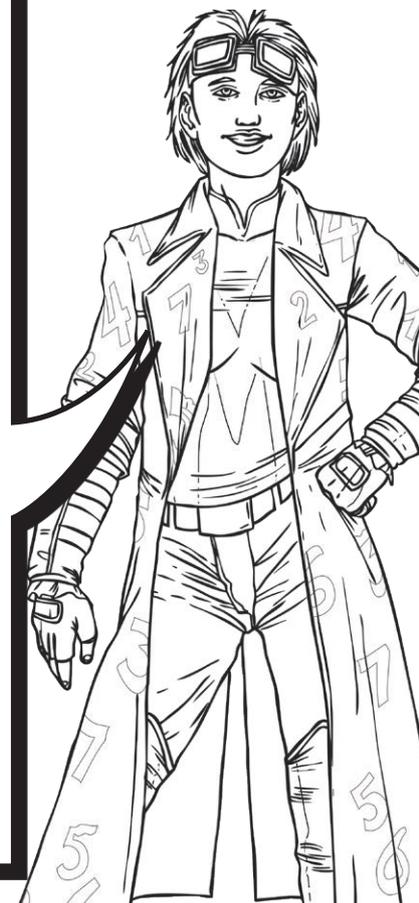
**1** Order the following heights from **shortest to tallest:**



| 1.82m | 1.7m | 1.62m | 1.77m | 1.54m |

shortest                                                        tallest

☐  ☐  ☐  ☐  ☐

1 mark

**2** Write the correct sign **< , > or =** to make these statements correct.

a)   0.9  ☐  0.09

b)   1.2  ☐  1.22

c)   3.122  ☐  3.211

1 mark

**3** Circle **all** the numbers that are **greater** than **0.4**.

4.004        0.49        0.04        0.54        0.375

1 mark

**4** What number is **halfway** between 1.2 and 2.1?

**halfway between**

| 1.2 |————————| |————————| 2.1 |
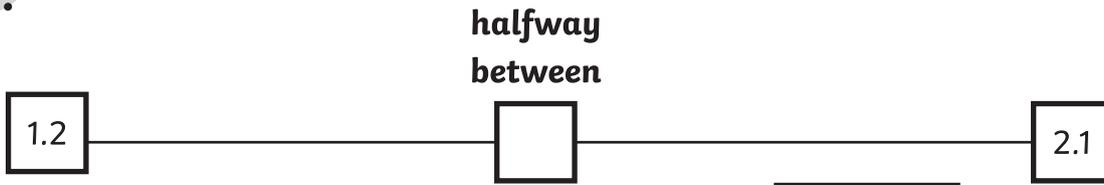
1 mark

**5** Jia says,

> 7.34 is **greater than** 7.4
> because 34 is greater than 4

JIA
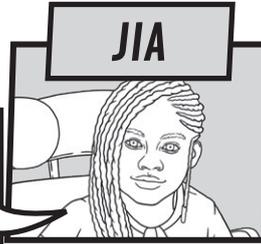
Jia is **incorrect**.
**Explain** why.

1 mark

/5

**TOTAL**

# MISSION COMPLETE!



How confident do you feel?

# INTERACTIVE GAME

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**SCAN ME**

# NOTES

# WORKING OUT
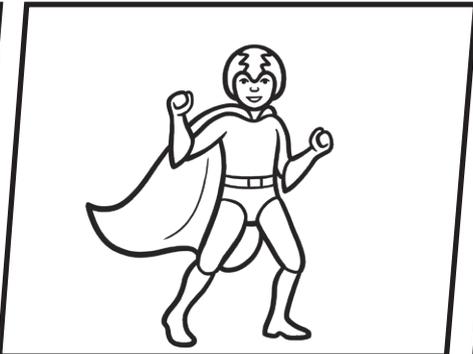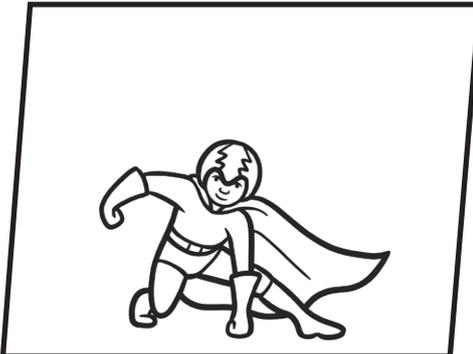
## SUPERCHARGE!

SCORE: ☐ /8

Use the code to reveal the secret word.

| t | e | i | y | d | n |
|---|---|---|---|---|---|
| 1000 | 8020 | 4000 | 3800 | 700 | 2100 |

| | Answer | Letter |
|---|---|---|
| 3865 rounded to the nearest 1000 | | |
| 749 rounded to the nearest 100 | | |
| 8017 rounded to the nearest 10 | | |
| 2138 rounded to the nearest 100 | | |
| 1342 rounded to the nearest 1000 | | |
| 4003 rounded to the nearest 10 | | |
| 987 rounded to the nearest 100 | | |
| 3781 rounded to the nearest 100 | | |

**Answer: identity**

## BOOST YOUR SUPERPOWERS

We can round numbers to make **estimates** or to explain how **near in value** a number is to another number. We round whole numbers to different **powers of ten.**

Remember to look at the **digit** one place to the **right** of the **place value column you are rounding to**.

⟵ 1  2  3  4 ⟨5  6  7  8  9 ⟶
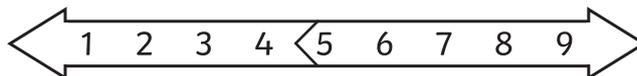
If the digit immediately to the right of the place value column you are rounding to is **0, 1, 2, 3 or 4,** we round the number to the **previous multiple**.

If the digit immediately to the right of the place value column you are rounding to is **5, 6, 7, 8 or 9,** we round to the next multiple.

REVISION VIDEO ▶ SCAN ME
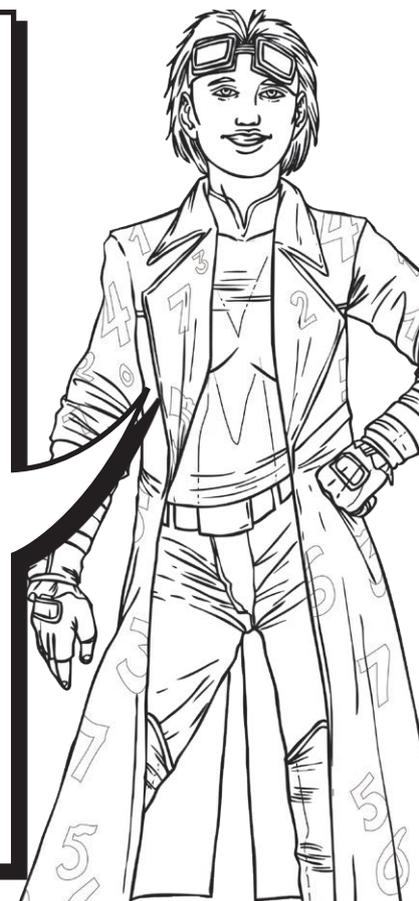
**1** Round 48 274 659 to:

a) the nearest **10 000**

b) the nearest **1000**

c) the nearest **100**

*2 marks*

**2** Elias puts these five numbers in their correct position on a number line.

707          696

713          689          721

a) Write the number **closest** to 700.

*1 mark*

b) Write the number **furthest** from 700.

*1 mark*

**3** Write the number that is **nearest** to 3000, which uses all of these digits: **1, 2, 3** and **4**.

*1 mark*

**4**  Emily thinks of a **whole number**.

She multiplies it by **3**.

She rounds her answer to the nearest **10**.

The result is **20**.

Write **all** the possible numbers that Emily could have started with.

_____

**5**  The **difference** between two **whole numbers** is **4**.

When each number is rounded to the nearest thousand, the difference between them is 1000.
Each number is greater than 3000 but less than 4000.

Write what the two numbers could be.

[    ]  and  [    ]

1 mark

/8

**TOTAL**

# MISSION COMPLETE!



## How confident do you feel?

# INTERACTIVE GAME

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**SCAN ME**

# NOTES

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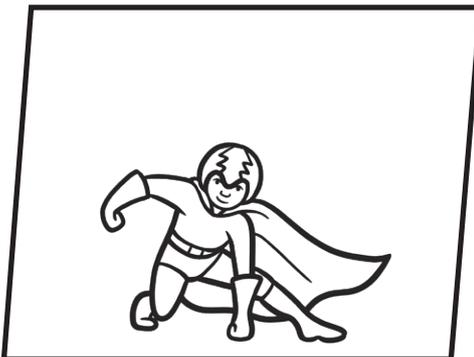
## SUPERCHARGE!

What number am I?

1) I start with a number.

   I multiply it by **10**.

   I add **0.2**.

   I multiply it by **100**.

   I end with the number **520**.

   What number did I start with?

2) I start with a number.

   I multiply it by **10**.

   I add **0.4**.

   I multiply it by **7**.

   I end with the number **14**.

   What number did I start with?

## BOOST YOUR SUPERPOWERS

**Rounding to the Nearest Whole Number**

1) Mark the **ones** digit.

2) Then, look at the **tenths digit**.

3) If the tenths digit is **0, 1, 2, 3 or 4**, we round the number **down** so the **ones digit doesn't change.** If the tenths digit is **5, 6, 7, 8 or 9**, we round the number up so the **ones digit increases by 1**.

4) **Remove** all the digits after the decimal point to get the rounded number.

**Rounding to the Nearest Tenth**

1) Mark the **tenths** digit.

2) Then, look at the **hundredths digit.**

3) If the hundredths digit is **0, 1, 2, 3 or 4**, we round the number **down** so the **tenths digit doesn't change.** If the hundredths digit is **5, 6, 7, 8 or 9**, we round the number up so the **tenths digit increases by 1**.

4) **Remove** all the digits to the **right** of the tenths digit to get the rounded number.

REVISION VIDEO

SCAN ME

# MATHS MISSION
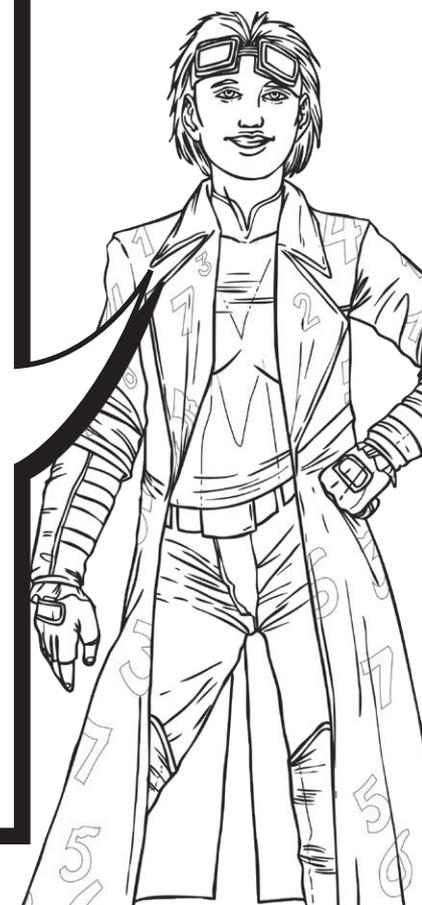
**1** Write in the missing numbers.

|  |  | Rounded to the nearest **whole number** |
|---|---|---|
| a) | 6.01 |  |
| b) | 9.61 |  |
| c) | 14.51 |  |
| d) | 17.19 |  |

*2 marks*

**2** Circle **all** the numbers that round to **32.7** when rounded to the nearest tenth.

32.68        32.07        32.72        32.27        32.56

*1 mark*

**3** Elena is thinking of a number with two decimal places.
Rounded to the **nearest whole number**, her number is **8**.
Rounded to the **nearest tenth**, her number is **7.8**.

a) Circle all the possible numbers Elena could be thinking of.

7.97                        8.05                        7.81

8.22                        7.84                        7.75

*1 mark*

b) Write two more **different numbers** that Elena could be thinking of.
They must have **different tenths digits** from each other.

[        ]  and  [        ]

*1 mark*

**4** Joseph bought string to make **two** necklaces.
One necklace was 35.8cm long.
The second necklace was 40.9cm long.

What is the shortest length of string Joseph had to buy to make both necklaces? **Round** your answer to the **nearest cm.**

show your method

cm

2 marks

**5** Amrit rounds 5.65 to the **nearest tenth** and writes 5.6 as her answer.
Amrit is **incorrect**. **Explain** how you know.
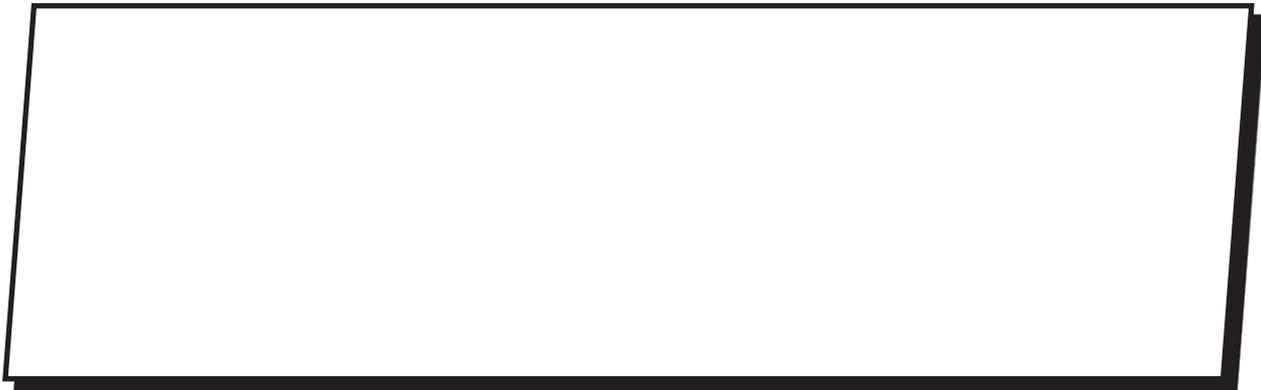
1 mark

/8

TOTAL

# MISSION COMPLETE!

## How confident do you feel?

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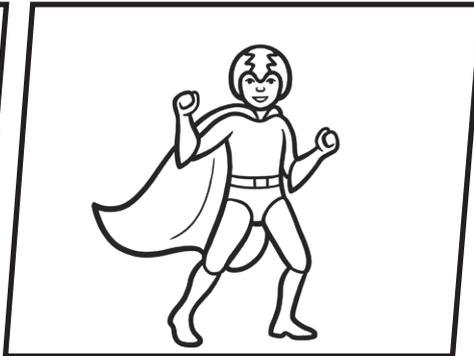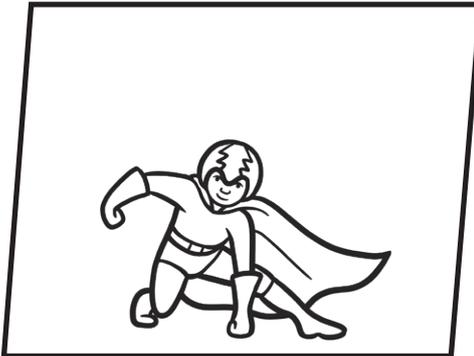
## SUPERCHARGE!

SCORE: ☐ /7

Match the value of each calculation to its answer written as a **Roman numeral**.

| a) 5 × 2 | b) $10^2$ | c) -3 + 4 | d) double 250 | e) 10 000 ÷ 10 | f) half of 100 | g) 3 < ? < 7 |

$$\boxed{I} \quad \boxed{M} \quad \boxed{V} \quad \boxed{X} \quad \boxed{D} \quad \boxed{C} \quad \boxed{L}$$

**Answers: a)** X **b)** C **c)** I **d)** D **e)** M **f)** L **g)** V

## BOOST YOUR SUPERPOWERS

Roman numerals are based on seven different symbols that are combined to represent different values.

| I | V | X | L | C | D | M |
|---|---|---|---|---|---|---|
| 1 | 5 | 10 | 50 | 100 | 500 | 1000 |

When a symbol with a **smaller value** is placed **after** a symbol with an equal or **greater value**, we use **addition**.

VI = 6 because we read the symbols as 5 + 1
MMMDXXV = 3525 because we read the symbols as 1000 + 1000 + 1000 + 500 + 10 + 10 + 5

When a symbol with a **smaller value** is placed **before** a symbol with a **greater value**, we use **subtraction**.

IV = 4 because we read the symbols as 5 − 1
CMXLIX = 949 because we read the symbols as (1000 − 100) + (50 − 10) + (10 − 1)

REVISION VIDEO | SCAN ME
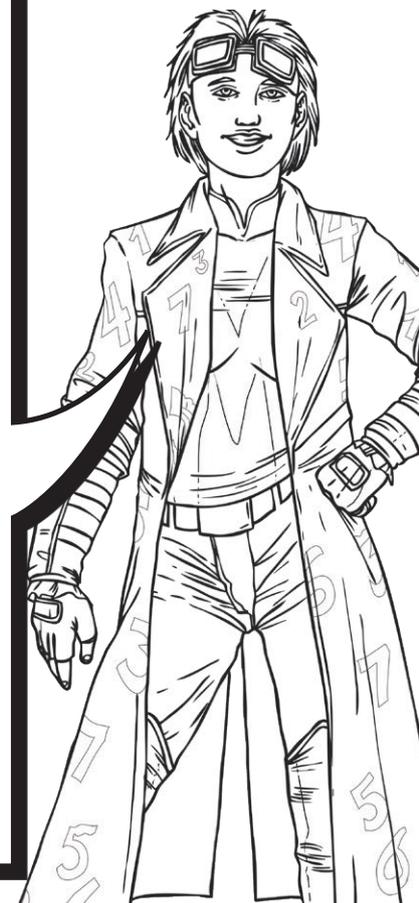
**1** Here is a number written in Roman numerals.

# MMDLXIV

Write the number in digits.

1 mark

**2** Complete the table.

|  | Number | Roman Numerals |
|---|---|---|
|  | 62 | LXII |
| a) |  | CCCXLV |
| b) |  | MDIX |

2 marks

**3** Hari has written four numbers in Roman numerals and in digits.
Circle Hari's **mistake**.

CCCXX = 320      CCXC = 290      CXXX = 130       XC = 110

1 mark

**4** Look at these numbers written in Roman numerals.

CDXXXVII      DCLXI      CCLIX      DCV

a) Circle the smallest number.

b) What is the value of the largest number?

2 marks

**5** Zeke says,

> On my Roman numeral clock face, the big hand is on the VII and the little hand is between the IV and the V.

**ZEKE**

What is the time on Zeke's clock face?

**6** Write the answers to these calculations in **Roman numerals.**
One has been done for you.

IV + VII = XI

a) XLII + LXV =

b) DCXX − CCXC =

/9

**TOTAL**

# MISSION COMPLETE!

## How confident do you feel?

# INTERACTIVE GAME

Scan this QR code to access a Twinkl Go! Game to further practise your maths skills.

**SCAN ME**

# NOTES

# WORKING OUT

**1** Find the missing values in these partitioned numbers.

a) 500 000 + ☐ + 500 + 60 + 3 = 530 563

b) 8 000 000 + 10 000 + 70 = ☐

2 marks

**2** Write the correct symbol in each box to make the statements correct.

| > | = | < |

a) 9 × 8 ☐ 7 × 10

b) 180 ÷ 30 ☐ 240 ÷ 40

c) 350 ÷ 5 ☐ 20 ÷ 4
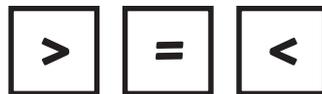
d) 50 × 5 ☐ 3 × 80

2 marks

**3** Write in the missing number that is **halfway** between **-6** and **2**.

**halfway between**

-6 ———— ☐ ———— 2
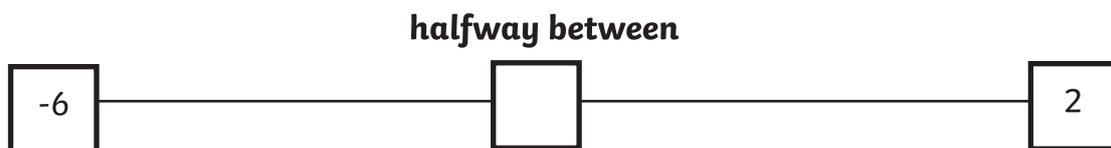
1 mark

**4** Priya is thinking of a 6-digit whole number that, when rounded to the **nearest 1000**, is 200 000.

a) What is the **smallest** possible number that Priya could be thinking of? ☐

1 mark

b) What is the **greatest** possible number that Priya could be thinking of? ☐

1 mark

**5** Write these numbers in order, starting with the **greatest.**

6.13         3.6         6.3         6.116         3.16

☐         ☐         ☐         ☐         ☐

1 mark

**6** Two superheroes have **rounded** this number.     8.45

I rounded it to **1 decimal place.** Then, I rounded the answer I got to the nearest **whole number** and I ended up with 9.

I rounded it to the nearest **whole number** and I got 8.

**Explain** how this is possible.

1 mark

/9

**TOTAL**

## MISSION COMPLETE!
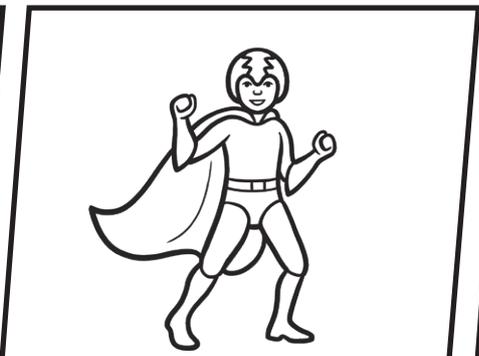
### How confident do you feel?

# PROGRESS TRACKER

Write your scores from each concept in this unit to track your progress.

| | |
|---|---|
| Reasoning About Place Value | **/ 7** |
| Comparing and Ordering Positive Integers | **/ 8** |
| Negative Integers | **/ 6** |
| Comparing and Ordering Decimals | **/ 5** |
| Rounding Positive Integers | **/ 8** |
| Rounding Decimals | **/ 8** |
| Roman Numerals | **/ 9** |
| Number and Place Value Mixed Practice | **/ 9** |
| **TOTAL** | **/ 60** |

## SELF-REFLECTION

What went well:

_____

_____

My target to improve:

_____

_____

Great work!

It's time to recharge ready for the next unit with this mindfulness colouring page.

# SUPERCHARGE!

SCORE: ☐ /5

The missing values are whole numbers between 1 and 9 and each digit can only be used once. Each row and each column form a calculation. The answer to each calculation is at the end of the corresponding row or column.

| a) | + | b) | + | c) | **21** |
|---|---|---|---|---|---|
| + | ■ | + | ■ | − | |
| 5 | − | 1 | − | d) | **1** |
| − | ■ | − | ■ | − | |
| 2 | − | 9 | + | e) | **−3** |

| 9 | −1 | 1 |
|---|---|---|

Answers: a) 6  b) 7  c) 8  d) 3  e) 4

# BOOST YOUR SUPERPOWERS

Remember to add the digits in each column, **starting from the right-hand side.**

Only write **a single digit** in the answer box of each place value column. If the total of the digits in any column is greater than 9, regroup to the next place value column on the left.

Remember to **include any regrouped digits** when finding the total of each place value column.

|   | TTh | Th | H | T | O |
|---|---|---|---|---|---|
|   | 3 | 5 | 6 | 2 | 8 |
| + |   | 7 | 9 | 8 | 6 |
|   | **4** | **3** | **6** | **1** | **4** |
|   | 1 | 1 | 1 | 1 |   |

**1** Write the largest possible whole number to make this statement true.

$$49 + \boxed{\phantom{00}} < 82$$

1 mark

**2** Hari and Abi are playing a video game. Hari scores 192 points. Abi scores 189 points.

How many points do they score in total?

| points |
| --- |

1 mark

**3** Here are six digit cards.

| 8 | 8 | 8 | 3 | 3 | 3 |
| --- | --- | --- | --- | --- | --- |

Use **five** of the digit cards to make this sum correct.

$$\begin{array}{r} \boxed{\phantom{0}}\boxed{\phantom{0}}\boxed{\phantom{0}} \\ +\ \ \boxed{\phantom{0}}\boxed{\phantom{0}} \\ \hline 4\ 2\ 1 \\ \hline \end{array}$$

1 mark

**4** Felix has **three** boxes. Two of the boxes are 46mm in height. The third box is 38mm in height. What is the **total height** of the pile of boxes?

show your method

mm

1 mark

**5** This table shows the population of different places.

| Victory Valley | 36 092 |
| --- | --- |
| Cinder City | 99 999 |
| Tundra Town | 19 437 |

What is the population of these three places **altogether**?

show your method

2 marks

/6

**TOTAL**

# MISSION COMPLETE!

## How confident do you feel?

# INTERACTIVE GAME

Scan this QR code to access a Twinkl Go! Game to further practise your maths skills.

**SCAN ME**

# NOTES

# WORKING OUT

## SUPERCHARGE!

The number in each hexagon is the total of the two numbers below it.

Fill in the missing numbers in the empty hexagons.

```
        100
      34    a)
    b)   18   c)
  d)   e)   11   f)
```
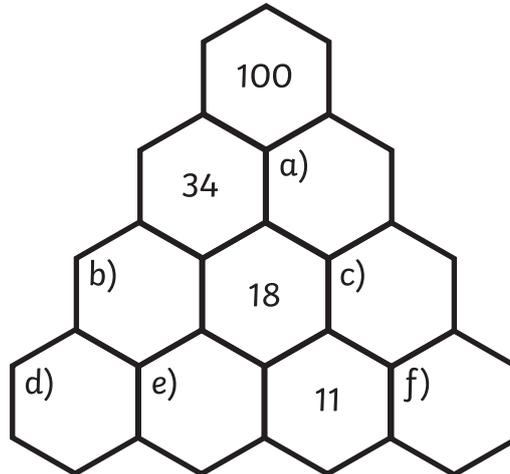
Answers: a) 66  b) 16  c) 48  d) 9  e) 7  f) 37

## BOOST YOUR SUPERPOWERS

Remember to **subtract** the digits in each column starting from the **right-hand side.**

You must always subtract the **bottom number** from the **top number.**

If the top digit has a **smaller value** than the bottom digit, **exchange** from the **next place value column to the left.**

| | M | HTh | TTh | Th | H | T | O |
|---|---|---|---|---|---|---|---|
| | 6 | ³4̶ | ¹5 | 9 | ⁵6̶ | ¹⁶7̶ | ¹5 |
| – | | 3 | 7 | 2 | 1 | 8 | 6 |
| | **6** | **0** | **8** | **7** | **4** | **8** | **9** |
| | | | | | | | |

SCAN ME
REVISION VIDEO

**1** The original price of this cape is £7.99
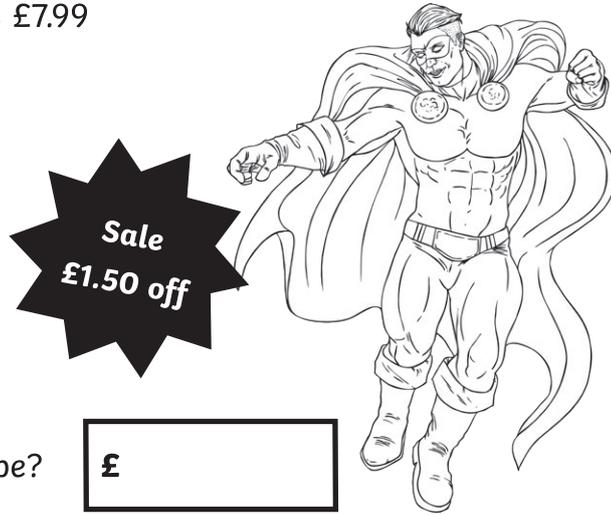
Sale
£1.50 off

What is the **sale** price of the cape?   £ [          ]

1 mark

**2** Write the missing digits.

[  ] 2  –  4 [  ]  =  2 9

1 mark

**3** Circle **all** of the calculations which are equal to **250**

500 – 250         100 – 750         770 – 520

320 – 70         450 – 250

2 marks

**4** Drew is working with **whole** numbers.

DREW

If you subtract a 3-digit number from a 4-digit number, you cannot get a 3-digit number.

Is Drew correct? Circle Yes or No.     Yes  /  No

Explain why.

**5** Three of the Maths Heroes had a competition to see who could fly the furthest in ten seconds.

Captain Calculation came first and flew 235 489 metres in ten seconds. The Fraction Flame came second and flew a distance that was 63 291 metres less than Captain Calculation's.

Ratio Rescuer flew a distance that was 28 403 metres less than The Fraction Flame's.

How far did Ratio Rescuer fly?

show your method

metres

/7

TOTAL

# MISSION COMPLETE!

How confident do you feel?

## NOTES

## WORKING OUT

## INTERACTIVE GAME

Scan this QR code to access a Twinkl Go! Game to further practise your maths skills.

SCAN ME

## SUPERCHARGE!

SCORE: | /28

Complete the times table chart.

| × | 3 | 5 | 6 | 7 | 8 | 10 | 12 |
|---|---|---|---|---|---|----|----|
| 7 | | | | | | | |
| 8 | | | | | | | |
| 9 | | | | | | | |
| 12 | | | | | | | |

Answers: Use the times table chart on page 165 to check your answers.

## BOOST YOUR SUPERPOWERS

**Long Multiplication**

Starting on the **right-hand** side, multiply each digit in the top number by the ones digit in the bottom number. We can only write a single digit in each column, so if the product is a 2-digit number, we must **regroup** into the next column. We must remember to add any regrouped digits to the following multiplication answer. On the next row, we **place a zero** in the ones column to show that we are multiplying by a power of ten. Multiply each digit in the top number by the digit in the tens column, regrouping where necessary. Finally, **add** the two products using **column addition.**

| TTh | Th | H | T | O |
|-----|----|----|----|----|
| | | 5 | 8 | 3 |
| × | | | 4 | 9 |
| | 5 | $2_7$ | $4_2$ | 7 |
| 2 | $3_3$ | $3_1$ | 2 | 0 |
| **2** | **8** | **5** | **6** | **7** |
| | | | | |

SCAN ME · REVISION VIDEO ▶

SCAN ME · REVISION VIDEO ▶

**1** Jia chooses a **whole number.**

When she multiplies her number by 3, the answer is less than 50.

When she multiplies her number by 4, the answer is greater than 50.

Write a number that Jia could have started with.

1 mark

**2** Here are five digit cards. Use **four** of the digit cards **once**, to make the calculations correct.

| 3 | 4 | 6 | 8 | 9 |

a) 48 = ☐ × ☐

b) 36 = ☐ × ☐

1 mark

**3** Elias knows that 525 × 42 = 22 050

**Explain** how Elias can use this information to work out this multiplication.

526 × 42

1 mark

**4** A **pack** of paper contains 481 sheets. An office orders 26 **packs**. How many **sheets** of paper have been ordered?

show your method

sheets

2 marks

**5** A box contains packs of pencils. One pack contains **35 pencils.** A box contains **5 packs.** A school orders **60 boxes.** How many pencils has the school bought?

show your method

pencils

2 marks

/7

**TOTAL**

# MISSION COMPLETE!

## How confident do you feel?

# INTERACTIVE GAME

Scan this QR code to access a Twinkl Go! Game to further practise your maths skills.

**SCAN ME**

# NOTES

# WORKING OUT

## SUPERCHARGE!

Divide the number in the middle by its factors.

Left wheel (center 36):
- a) ÷2
- b) ÷3
- c) ÷4
- d) ÷6
- e) ÷9
- f) ÷12

Right wheel (center 48):
- g) ÷2
- h) ÷3
- i) ÷4
- j) ÷6
- k) ÷8
- l) ÷12
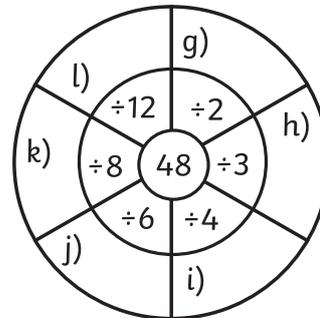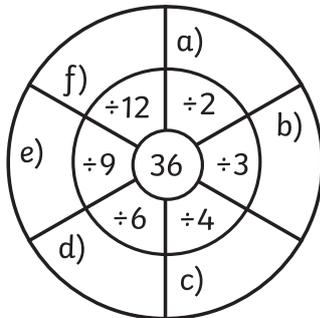
Answers: a) 18  b) 12  c) 9  d) 6  e) 4  f) 3  g) 24  h) 16  i) 12  j) 8  k) 6

## BOOST YOUR SUPERPOWERS

### Short Division

Short division is a useful method for dividing a number by a **1-digit** number. Divide each digit of the dividend by the divisor, starting with the digit with the **greatest** value. Write each answer above the horizontal line and **exchange** any remainder to the next digit.

| | 1 | 5 | 7 | 2 |
|---|---|---|---|---|
| 6 | 9 | 3/4 | 4/3 | 1/2 |

### Long Division

Long division is a useful method for dividing a number by a **2-digit** number or larger. Divide the each digit of the dividend by the divisor. Write the answer above the horizontal line and the multiple of the divisor under the dividend. Use column **subtraction** to calculate the remainder and draw down the next digit of the dividend. **Repeat** this process until the end of the calculation.

| | | | 3 | 4 |
|---|---|---|---|---|
| 1 | 3 | 4 | 4 | 2 |
| | | 0 | ↓ | |
| | | 4 | 4 | |
| | – | 3 | 9 | ↓ |
| | | | 5 | 2 |
| | | – | 5 | 2 |
| | | | | 0 |
| | | | | |

REVISION VIDEO — SCAN ME

REVISION VIDEO — SCAN ME

**1** One **pack** contains 8 fairy cakes. Bartek needs 100 fairy cakes for his party.

How many **packs** of fairy cakes would he need to buy?

| packs |

1 mark

**2** 4 divides into 30 with a remainder of 2.
Write **one** other number that divides into 30 with a remainder of 2.

1 mark

**3** The Data Defender's belt measures 800mm.

The belt is made up of sections that are all 16mm wide.

How many sections does the belt have?

| sections |

1 mark

**4** At the Maths Hero University, there are 5 trainee superheroes in each class. This year, there are **1185** hopeful new recruits.
How many **classes** are needed for all the trainees?

show your method

| classes |

2 marks

**5** Joseph is restocking his cafe. **Each day**, the cafe sells an average of **111 cans** of cola. Joseph needs to buy enough cans of cola for a festival which lasts for **4 days.**

A **tray** sold by the catering company holds **12 cans** of cola. How many **trays** of cola cans does Joseph need to order for the festival?

show your method

| | trays |

2 marks

/7

**TOTAL**

# *MISSION COMPLETE!*

### How confident do you feel?

# INTERACTIVE GAME

Scan this QR code to access a Twinkl Go! Game to further practise your maths skills.

**SCAN ME**

# NOTES

# WORKING OUT

## SUPERCHARGE!

SCORE: ☐ /4

Each emoji represents a number. To solve the final calculation, find the number that each emoji represents.

🎭 + 🎭 + 🎭 = 24

🎭 + 🎭 + 💎 = 18

💎 + 🗡️ + 🗡️ = 14

a) 🎭 = ☐    b) 💎 = ☐    c) 🗡️ = ☐

🎭 × 💎 + 🗡️ = d) ☐

Answers: a) 8  b) 2  c) 6  d) 22

## BOOST YOUR SUPERPOWERS

These problems have calculations with digits missing and empty boxes in their place. We can find the missing digits using **inverse operations**.

|   | 2 | 7 |
|---|---|---|
| + | 5 | ☐ |
|   | 8 | 6 |

→

|   | 2 | 7 |
|---|---|---|
| + | 5 | **9** |
|   | 8 | 6 |
|   |   | 1 |

In this column addition example, we start with the right-hand column like standard column addition.

In the ones column, we can see that **regrouping** has occurred because 6 is smaller in value than 7. As this is column addition, the sum of the two ones digits must be greater in value than each of the ones digits being put together. This means that the calculation is **7 + ☐ = 16** rather than 7 + ☐ = 6

Therefore, there must be **1 regrouped ten** in the tens column.

Now, we know that the calculation is 7 + ☐ = 16, we can use the inverse to work out that 16 − 7 = **9**

**9** is the missing digit.

REVISION VIDEO | SCAN ME

**1**    Write the missing digits to make these calculations correct.

a)

|   | □ | 3 | 5 | □ |
|---|---|---|---|---|
| + | 3 | □ | 8 | 9 |
|   | 5 | 0 | 4 | 6 |

b)

|   | 3 | □ | 3 | 0 | □ |
|---|---|---|---|---|---|
| + |   | 6 | 0 | □ | 3 |
|   | 4 | 5 | 3 | 4 | 2 |

2 marks

**2**    Write the missing digits to make these calculations correct.

a)

|   | 4 | □ | □ | 8 |
|---|---|---|---|---|
| − | 3 | 3 | 3 | □ |
|   | 1 | 4 | 3 | 2 |

b)

|   | 7 | 6 | □ | 4 | 1 |
|---|---|---|---|---|---|
| − |   | □ | 9 | □ | 4 |
|   | 7 | 1 | 4 | 0 | 7 |

2 marks

**3**    Write the missing digits to make these calculations correct.

a)

|   | □ | 5 | □ | 7 |
|---|---|---|---|---|
| × |   |   |   | □ |
| 2 | 5 | 7 | 6 | 1 |

b)

|   |   | 9 | 5 | □ | 3 |
|---|---|---|---|---|---|
|   | × |   |   | □ | 6 |
|   | 5 | 7 | 5 | 5 | 8 |
| 2 | 8 | 7 | 7 | 9 | 0 |
| 3 | 4 | 5 | 3 | 4 | 8 |

2 marks

**4** Write the missing digits to make these calculations correct.

Both calculations **do not** have remainders.

a)

| | | 7 | 7 |
|---|---|---|---|
| 9 | 6 | □ | □ |

b)

| | | 3 | □ | 5 |
|---|---|---|---|---|
| 8 | □ | 9 | 2 | 0 |

2 marks

**5** Write the missing digits to make these calculations correct.

a)

| | | □ | 2 | 1 | r1 |
|---|---|---|---|---|---|
| 3 | 1 | 8 | 6 | □ | |

b)

| | | 4 | □ | 8 | r2 |
|---|---|---|---|---|---|
| 3 | 1 | 3 | 7 | □ | |

2 marks

/10

**TOTAL**

# MISSION COMPLETE!



How confident do you feel?

# INTERACTIVE GAME

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SCAN ME

# NOTES

# WORKING OUT
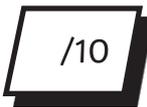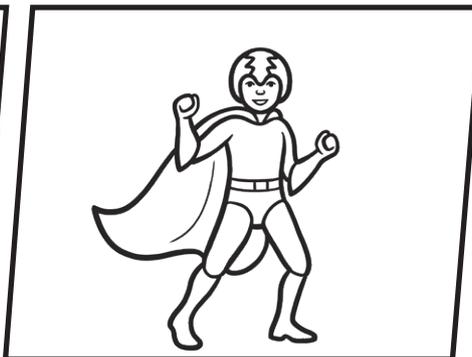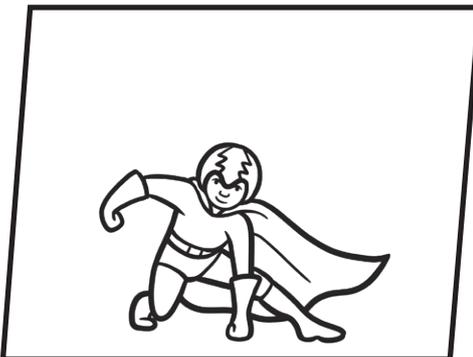
# SOLVING MULTI-STEP PROBLEMS
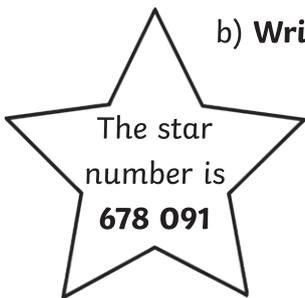
## SUPERCHARGE!

SCORE: /5

Answer the questions about the star number.

a) **Compare it** with the calculation using

**< > or =**

(17 + 14) × 1000 ☐ the star number

b) **Write it** in words:

_____

_____

_____

The star number is **678 091**

c) **Divide it** by 100 ☐

d) **Multiply it** by 10 ☐

e) **Round it** to the nearest 1000 ☐

**Answers: a)** < **b)** six hundred and seventy-eight thousand and ninety-one **c)** 6780.91 **d)** 6 780 910 **e)** 678 000
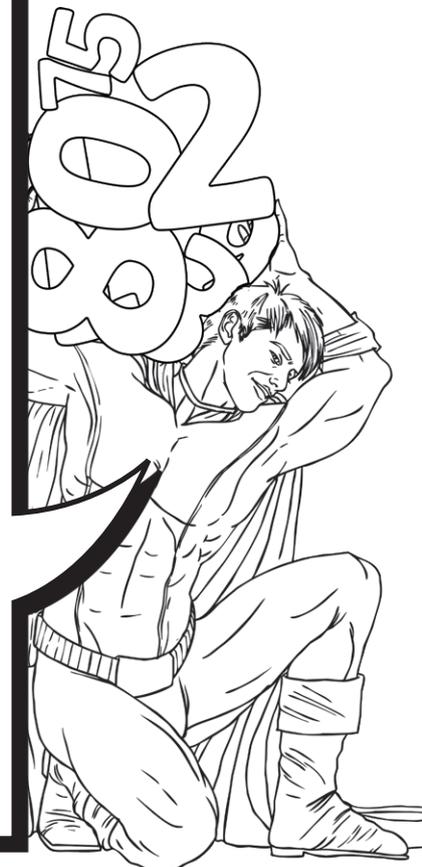
## BOOST YOUR SUPERPOWERS

To solve multi-step problems, it is a good idea to break the question down into smaller steps.

**Example:** 'A teacher has 14 packs of colouring pencils, each containing 25 pencils, and 9 packs of writing pencils, each containing 12 pencils. How many pencils does the teacher have altogether?'
In this example, the first step is to find out how many colouring pencils there are: 14 × 25 = 350

Next, we want to find out how many writing pencils there are: 9 × 12 = 108

Lastly, we want to find the total of all the pencils: 350 + 108 = 458

REVISION VIDEO
SCAN ME

**1** Twinkl Theme Park had a total of 90 382 visitors over Friday, Saturday and Sunday.

There were 27 018 visitors on Friday.

There were 32 515 visitors on Saturday.

How many visitors were there on **Sunday**?

show your method

| visitors |

2 marks

**2** There are 560 places at Maths Hero Training school.

The recruits are in two age groups.

This table shows the number of classes and the number of pupils in each class for each age group.

| Age in Years | Number of Classes | Number of pupils in each class |
|---|---|---|
| 4-7 | 5 | 27 |
| 8-11 | 10 | 31 |

How **many more** pupils can join Maths Hero Training school?

show your method

| pupils |

2 marks

**3** Amrit buys **4** superhero action figures **and** a superhero costume. She pays £61.50 **altogether.**

Emily buys **2** superhero action figures and pays £25 **altogether.**

How much does the **superhero costume** cost?

show
your
method

£

2 marks

/6

**TOTAL**

# MISSION COMPLETE!

How confident do you feel?

# INTERACTIVE GAME

Scan this QR code to access a Twinkl Go! Game to further practise your maths skills.

SCAN ME

# NOTES

# WORKING OUT

## SUPERCHARGE!

SCORE: ☐ /6

**True or false?**

a) 345 × 10 = 3045 _____

b) 11 × 11 = 30 × 4 _____

c) 5000 − 435 = 4565 _____

d) 303 ÷ 3 = 25 × 4 _____

e) 2 × (3 + 4) = 10 _____

f) 144 ÷ 12 = 84 ÷ 7 _____

Answers: a) False  b) False  c) True  d) False  e) False  f) True

## BOOST YOUR SUPERPOWERS

When multiplying a number by 10, 100 or 1000, the value of each digit is increased. Each digit moves the necessary number of places to the left.

| Th | H | T | O | t | h |
|----|---|---|---|---|---|
|    |   | 3 | 2 |   |   |
|    | **3** | **2** |   |   |   |

← × 10

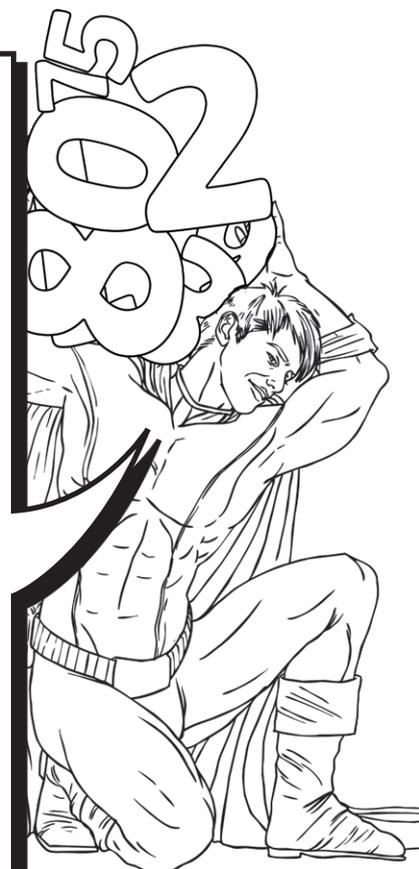| Th | H | T | O | t | h |
|----|---|---|---|---|---|
|    |   |   | 3 | 2 |   |
|    | **3** | **2** | **0** |   |   |

← × 100

When dividing a number by 10, 100 or 1000, the value of each decreases. Each digit moves the necessary number of places to the right.

| Th | H | T | O | t | h |
|----|---|---|---|---|---|
| 3 | 0 | 2 | 0 |   |   |
|    |   |   | **3** | **0** | **2** |

÷ 100 →

| Th | H | T | O | t | h |
|----|---|---|---|---|---|
| 3 | 0 | 2 | 0 |   |   |
|    |   | **3** | **0** | **2** |   |

÷ 1000 →

REVISION VIDEO SCAN ME

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**1** Circle the number that is **10 times greater** than eight hundred and three.

830          8300          83          8030

1 mark

**2** Complete the calculation.

1000   ×   351   =   10   ×   [          ]

1 mark

**3** One tonne is equal to 1000 kilograms.

Captain Calculation can lift a 4.1 tonne car.

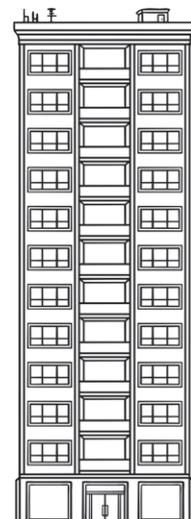How many **kilograms** can Captain Calculation lift?          [          kg]

1 mark

**4** Hero Hideaway is 3809cm in height and 724cm in width.

Jia is making a **one-hundredth** scale model of the tower.

What are the height and width measurements of Jia's tower model?

height = [          cm]

1 mark

width = [          cm]

1 mark

**5** Here are six cards.

| × 10 | × 100 | × 1000 | ÷ 10 | ÷ 100 | ÷ 1000 |

Use a card to complete each calculation.

7.4 [        ] = 0.074    7.4 [        ] = 0.74    7.4 [        ] = 0.0074

**6** The superheroes are working out the best deal on balloons for a celebration.

It costs £136 for 100 balloons from Twinkl Wholesalers.

It costs £1326 for 1000 from Twinkl Party Wares.

Which store has the best deal per balloon? **Explain** your answer.

## MISSION COMPLETE!

How confident do you feel?

# INTERACTIVE GAME

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SCAN ME

# NOTES

# WORKING OUT
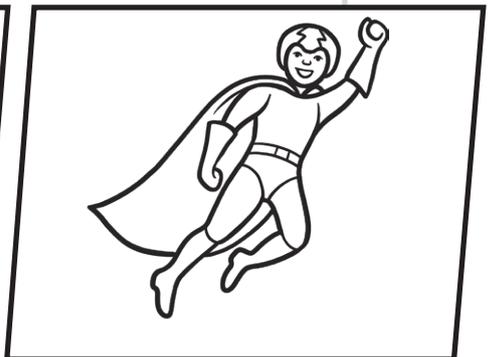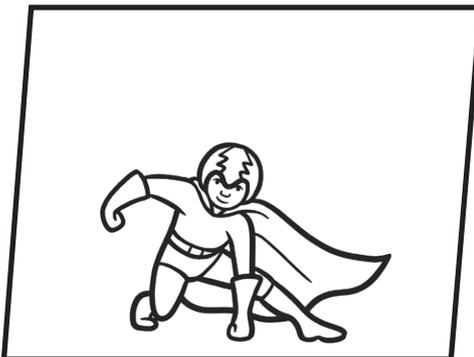
## SUPERCHARGE!

Use the code to reveal the secret word.

SCORE: [ ] /8

| a | g | d | u | n | i | r |
|---|---|---|---|---|---|---|
| 280 | 228 | 196 | 221 | 138 | 252 | 387 |

| | Answer | Letter |
|---|---|---|
| 6 × 38 | | |
| 17 × 13 | | |
| 5 × 56 | | |
| 43 × 9 | | |
| 14 × 14 | | |
| 7 × 36 | | |
| 35 × 8 | | |
| 6 × 23 | | |

Answers: guardian

## BOOST YOUR SUPERPOWERS

When multiplying or dividing decimals by integers, we can use our **known facts, partitioning or formal written methods.**

**Known Facts**

**1.2 × 7**

12 × 7 = 84

÷ 10        ÷ 10

1.2 × 7 = **8.4**

**Partitioning**

**4.8 ÷ 2**

4.8

4        0.8

÷ 2        ÷ 2

2   +   0.4= **2.4**

**Formal Written Methods**

**2.367 × 4**

| | 2 | . | 3 | 6 | 7 |
|---|---|---|---|---|---|
| × | | | | | 4 |
| | **9** | . | **4** | **6** | **8** |
| | | | 1 | 2 | 2 |

**8.79 ÷ 3**

| | | **2** | . | **9** | **3** |
|---|---|---|---|---|---|
| 3 | 8 | . | $^2$7 | 9 | |

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**1** In this pyramid, the number in each box is the **product** of the two numbers below it.

Write the missing numbers.

```
        55.2
     ┌──────┬──────┐
     │      │   6  │
  ┌──────┬──────┬──────┐
  │      │  4   │      │
  └──────┴──────┴──────┘
```
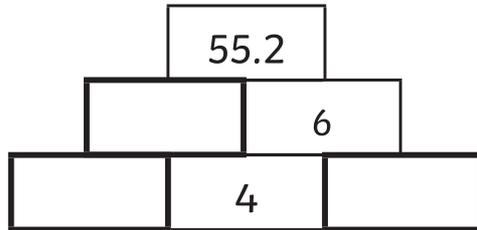
2 marks

**2** On average, The Fraction Flame flies 21.3km per second. If she continues at the same speed, how far would she travel in 5 seconds?

km

1 mark

**3** Write **two decimals**, each with a **value less than 1**, which multiply to make **0.15**

[ ] × [ ] = 0.15

1 mark

**4** Zeke buys 3 notebooks. He pays with a £10 note. His change is £2.59

What is the cost of **one** notebook?

show your method

£

2 marks

**5** Doctor Digit has 3 pairs of goggles. The **mass** of each pair of goggles is 0.28kg.

Agent Algebra has 5 eye masks. The **mass** of each eye mask is **half** the mass of one of Doctor Digit's pairs of goggles.

What is the **total mass** of all the goggles and eye masks?

DR DIGIT

AGENT ALGEBRA

show your method

kg

2 marks

/8

**TOTAL**

# MISSION COMPLETE!

## How confident do you feel?

# INTERACTIVE GAME

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**SCAN ME**

# NOTES

# WORKING OUT

## SUPERCHARGE!

a) $12 + 5^2 =$ ☐

b) $15 - 3 \times 4 =$ ☐

c) $29 - 3 + 4 \times 2 =$ ☐

d) $40 \times 2 - 8 \times 4 =$ ☐

e) $33 + 4^2 - 20 =$ ☐

**Answers: a) 37  b) 3  c) 34  d) 48  e) 29**

## BOOST YOUR SUPERPOWERS

| | |
|---|---|
| **B**rackets | $10 \times (4 + 2) = 10 \times 6 = 60$ |
| **I**ndices | $5 + 2^2 = 5 + 4 = 9$ |
| **D**ivision | $10 + 6 \div 2 = 10 + 3 = 13$ |
| **M**ultiply | $10 - 4 \times 2 = 10 - 8 = 2$ |
| **A**ddition | $7 + 4 \times 10 = 7 + 40 = 47$ |
| **S**ubtraction | $8 - 10 \div 2 = 8 - 5 = 3$ |

The acronym 'BIDMAS' tells us the order in which to complete calculations.

**Inverse operations** (addition and subtraction or multiplication and division) are of **equal importance** so should be completed in order from **left to right**.

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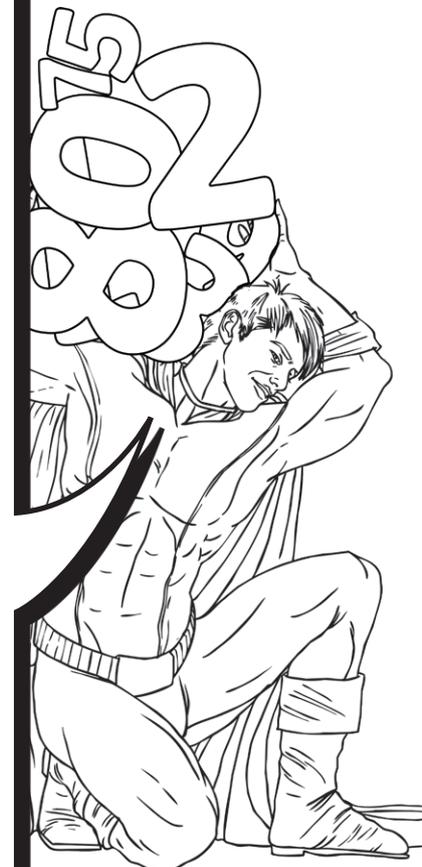
**1** Write what the missing numbers could be.

a) ( ☐ + ☐ ) + 60 = 100

1 mark

b) ( ☐ + ☐ ) + 80 = 100

1 mark

**2** Write +, −, × or ÷ to make the calculation correct.

a) 36 ☐ 4 × 5 = 56

1 mark

b) 2 ☐ (29 + 13) = 84

1 mark

**3** Here are five number cards.
Use **three** cards to make the calculation correct.

| 6 | 7 | 8 | 24 | 42 |

( ☐ × ☐ ) + ☐ = 50

1 mark

**4** Write the correct sign >, < or = to make the statements correct.

$(12 + 7) - 5$ ☐ $(9 + 5) - 1$

$9 \times (5 + 2)$ ☐ $(9 \times 2) + 12$

$(12 \times 2) \div 6$ ☐ $12 \times (6 \div 2)$

2 marks

**5** Add one pair of missing brackets to each of these calculations to make them correct.

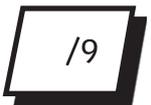$12 \times \ 5 + 15 = 75$

$63 \div 11 - 4 = 9$

$82 - 16 + 17 = 49$

2 marks

/9

**TOTAL**

## MISSION COMPLETE!

### How confident do you feel?

# INTERACTIVE GAME

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**SCAN ME**

# NOTES

# WORKING OUT

# MULTIPLES AND FACTORS

## SUPERCHARGE!

Circle the odd one out in each grid.

**a) Multiples of 3**

| | | |
|---|---|---|
| 21 | 3 | 6 |
| 13 | 24 | 15 |
| 9 | 30 | 12 |

**b) Factors of 24**

| | | |
|---|---|---|
| 6 | 24 | 3 |
| 2 | 4 | 7 |
| 1 | 8 | 12 |

**c) Multiples or Factors of 12**

| | | |
|---|---|---|
| 4 | 18 | 24 |
| 60 | 12 | 3 |
| 2 | 48 | 84 |

Answers: a) 13  b) 7  c) 18

## BOOST YOUR SUPERPOWERS

A **multiple** is a number that is the **product** of **multiplying** one whole number by another.

For example, **20** is a multiple of 5 and 4 because 5 × 4 = **20**

20
÷ ÷
5 × 4
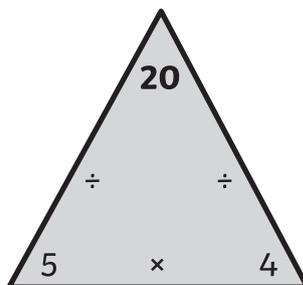
A **factor** is a **whole number** that can be **divided** into another **whole number**, with **no remainder**.

For example, **3** and **8** are factors of 24 because 24 ÷ 3 = **8** and 24 ÷ 8 = **3**

24
÷ ÷
3 × 8

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REVISION VIDEO  SCAN ME
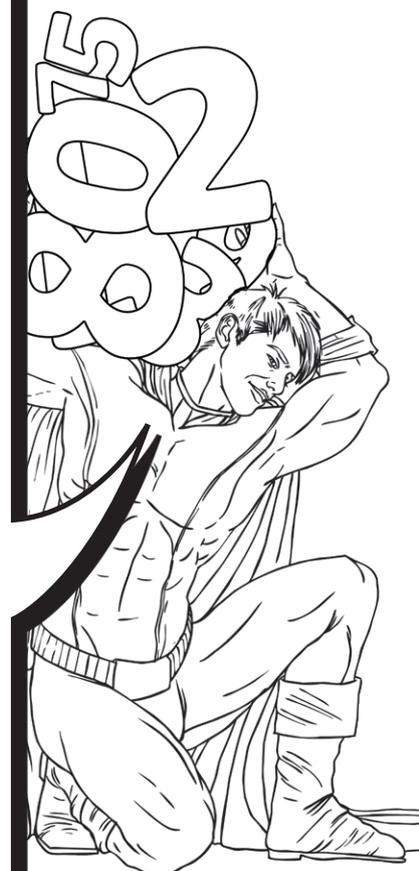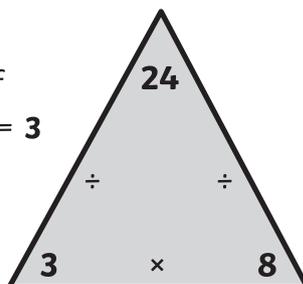
# MATHS MISSION

**1** The numbers in this sequence increase by the same amount each time

Write in the missing numbers.

| | 72 | 81 | | 99 | |

2 marks

**2** List all the factors of 18 which are also factors of 24.

_____

_____

2 marks

**3** Write each number below in its correct place on the diagram.

18  10

12  24

| | Multiple of 4 | Not a multiple of 4 |
|---|---|---|
| Multiple of 6 | | |
| Not a multiple of 6 | | |

2 marks

**4** Complete this sentence.

Every number with a factor of **15** must also have factors of

| | and | | and | |

1 mark

**5** Write all the common multiples of 7 and 2 that are **less than 30**

_____

**6** Here are five number cards.

| 3 | 4 | 5 | 6 | 7 |

Use each card **once** to make every statement below correct.

☐ is a factor of 56          ☐ is a factor of 16

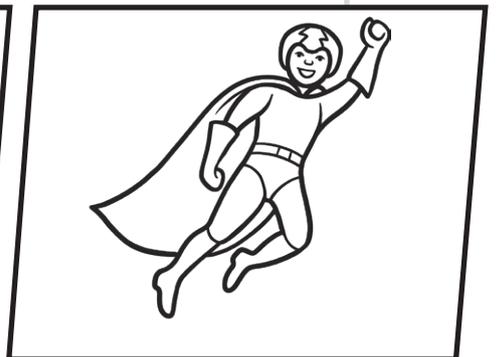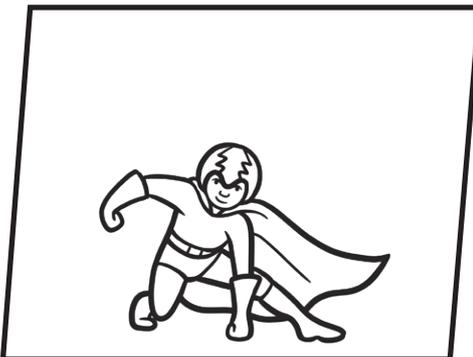☐ is a factor of 18          ☐ is a factor of 30

☐ is a factor of 39

# MISSION COMPLETE!

## How confident do you feel?

# INTERACTIVE GAME

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**SCAN ME**

# NOTES

# WORKING OUT

## SUPERCHARGE!

The missing values are whole numbers between 1 and 9 and each number can only be used once. Each row and column is a calculation with the answer at the end of the corresponding row or column. Remember to use **BIDMAS** rules.

| a) | + | 6 | ÷ | 2 | 10 |
|----|---|---|---|---|----|
| + | | ÷ | | + | |
| 5 | − | 3 | − | b) | −7 |
| − | | + | | × | |
| c) | + | d) | ÷ | e) | 3 |

| 11 | 10 | 38 |
|----|----|----|

Answers: a) 7  b) 9  c) 1  d) 8  e) 4

## BOOST YOUR SUPERPOWERS

We can **estimate** answers before we complete a calculation. We can then use our estimate to check our answers. If the answer is not close to the estimate, we know there has been a miscalculation.

We can use **rounding** to estimate an answer, for example:

Actual calculation: 2879 + 6747 = 9626

Rounded estimate (rounded to the nearest 100): 2900 + 6700 = 9600

We can round to the nearest 10, 100 or 1000 depending on the size of the numbers in the calculation.

Another way of checking answers is by using the **inverse operation**, for example:

Actual calculation: 7506 − 2344 = 5162

Inverse: 5162 + 2344 = 7506

| 7506 | |
|------|------|
| 5162 | 2344 |

**Inverse Operations**

+ ↔ −

× ↔ ÷

**1** Match the calculations to the number that is nearest to the correct answer. Round the numbers in the calculations to the nearest 10 to help you estimate. One has been done for you.

| | |
|---|---|
| 278 + 491 | 320 |
| 621 − 304 | 770 |
| 867 + 255 | 1330 |
| 905 + 422 | 1190 |
| 827 + 364 | 1130 |

2 marks

**2** Estimate the answer to this calculation
432.04 + 709.57
Circle the correct estimate.

1000          1100          1200          1300          1400

1 mark

**3** 6516 ÷ 12 = 543
Explain how you can use this fact to solve 13 × 543

1 mark

**4** 38 080 = 448 × 85

Use this multiplication fact to complete the calculations below.

a) 448 × 8.5 = ☐

b) 4480 × 85 = ☐

c) 3808 ÷ 85 = ☐

**5** Zeke has £15

He wants to buy a pencil which costs £1.21, a highlighter which costs £2.13 and a pencil case which costs £10.57.

Does he have enough money to purchase all three items?

Circle **Yes** or **No**.                                            Yes / No

Use **estimation** and **rounding** to **explain** your answer.

# MISSION COMPLETE!

### How confident do you feel?

# INTERACTIVE GAME

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**SCAN ME**

# NOTES

# WORKING OUT
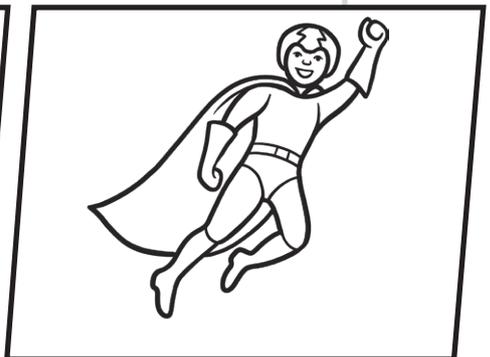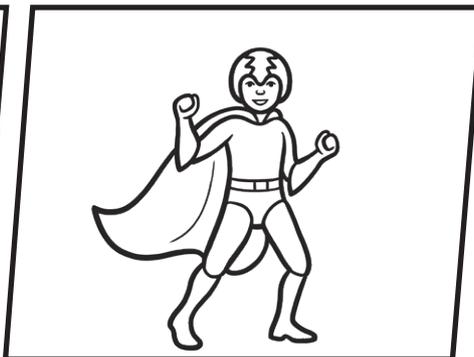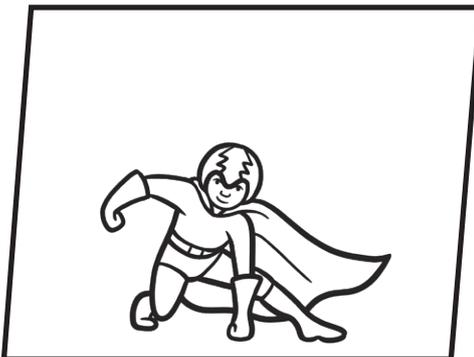
## SUPERCHARGE!

SCORE: ☐ /4

Match each number to one of its factors.

a)
49

b)
15

c)
18

d)
24

9

8

5

7

## BOOST YOUR SUPERPOWERS

**What are prime numbers?**

• A **prime number** is a whole number which only has **two factors**: **1** and **itself.**

• 0 and 1 are **not** prime numbers.

• Numbers which have **more** than two factors (i.e. not a prime number) are called **composite numbers.**

**Examples of prime numbers:**

2, 3, 5, 7, 11, 13, 17, 19, 23

REVISION VIDEO
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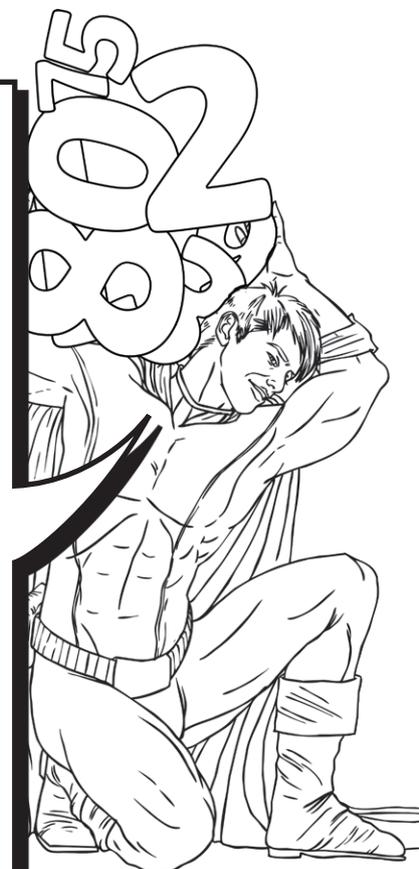
# MATHS MISSION

**1** Circle **all** the prime numbers.

17          27          37          47          57

1 mark

**2** Write the **three prime numbers** that multiply to make **195**

| | × | | × | | = 195

1 mark

**3** Priya says,

PRIYA

2 is the only even prime number.

Is Priya correct? Circle **Yes** or **No**.

Explain how you know.

1 mark

**4** Circle the prime number.

69          73          75

Explain how you know the other numbers are not prime numbers.

1 mark

**5** Here is a diagram for sorting numbers.
Write **all** four numbers in the correct boxes.
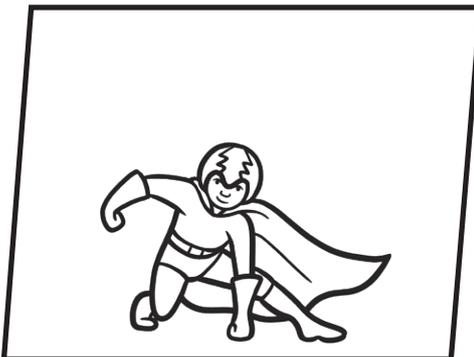
29          2          15          40
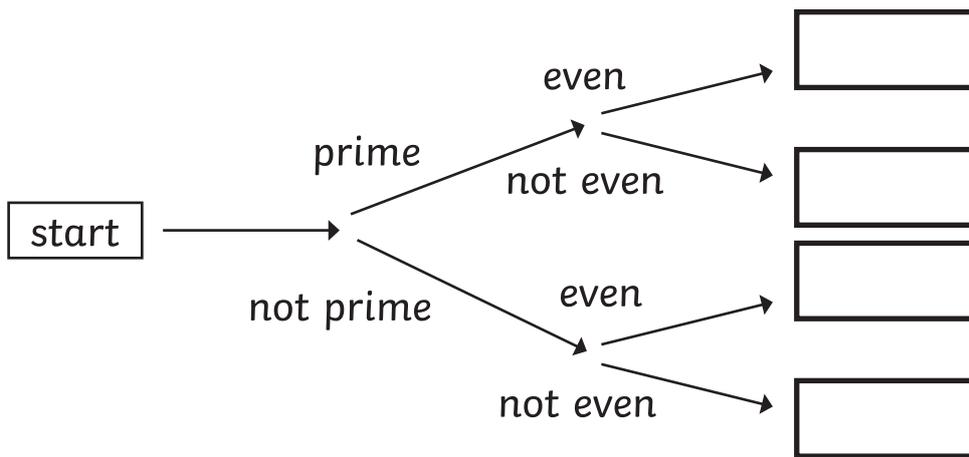
start → prime → even →
prime → not even →
not prime → even →
not prime → not even →

2 marks

/6

**TOTAL**

# MISSION COMPLETE!

### How confident do you feel?

# INTERACTIVE GAME

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**SCAN ME**

# NOTES

# WORKING OUT

## SUPERCHARGE!
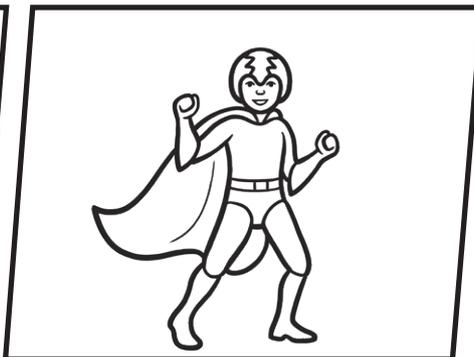
SCORE: ☐ /6

Write <, > or = to make the statements correct.

a) 52 ☐ 20

b) 43 ☐ 68

c) 102 ☐ 1000

d) 103 ☐ 1000

e) 62 ☐ 36

f) 92 ☐ 72

a) <   b) <   c) >   d) >   e) <   f) <

## BOOST YOUR SUPERPOWERS

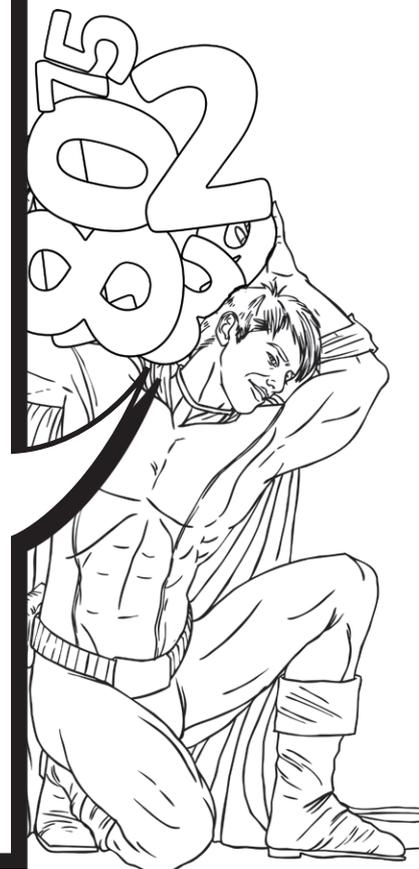**Square numbers:** The product of a number multiplied by itself, e.g.

$2^2 = 2 \times 2 = 4$

$5^2 = 5 \times 5 = 25$

$7^2 = 7 \times 7 = 49$

**Cube numbers:** The product of a number multiplied by itself three times.

$2^3 = 2 \times 2 \times 2 = 8$

$5^3 = 5 \times 5 \times 5 = 125$

$7^3 = 7 \times 7 \times 7 = 343$

REVISION VIDEO ▶ SCAN ME

**1** Circle the **square** numbers.

4          17          25          8          21

1 mark

**2** Write two **cube** numbers that total 189

☐ + ☐ = 189

1 mark

**3** Here is a Carroll diagram for numbers. Write a number less than **100** in each space.

|  | a square number | **not** a square number |
|---|---|---|
| even |  |  |
| **not** even |  |  |

2 mark

**4** Put these values in order from smallest to greatest.

$4^2$          $2^3$          $9^2$          $2^2$          $3^3$

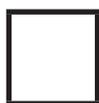☐    ☐    ☐    ☐    ☐
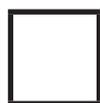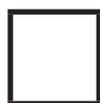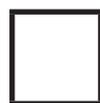
smallest                          greatest

1 mark

**5** Here are six digit cards.

| 1 | 2 | 3 | 4 | 5 | 6 |
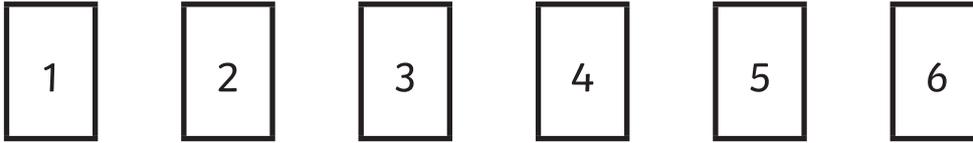
Choose **two cards** each time to make the following two-digit numbers.

Use each digit card once.

a) a **prime** number ☐ ☐

b) a **square** number ☐ ☐

c) a **cube** number ☐ ☐

2 mark

/7

**TOTAL**

## MISSION COMPLETE!

### How confident do you feel?

# INTERACTIVE GAME

Scan this QR code to access a Twinkl Go! Game to further practise your maths skills.

SCAN ME

# NOTES

# WORKING OUT

**1** This table shows the number of tickets sold on a concert tour.

| Venue | Tickets sold |
|---|---|
| London | 98 027 |
| Paris | 89 744 |
| Barcelona | 83 118 |
| Rome | 92 370 |

a) What was the total number of tickets sold in London and Paris?

1 mark

b) What was the difference between the number of tickets sold in Rome and Barcelona?

1 mark

**2** Each side of this square must add up to 160
Write in the missing numbers.

| | 80 | |
|---|---|---|
| | | 100 |
| 70 | | 20 |

1 mark

**3** Write the missing number to make this division correct.

$$0.7 \div \boxed{\phantom{00}} = 0.07$$

1 mark

**4** In this sequence, the rule is **multiply by 2 and then add 5.**
Write the missing numbers.

| | 27 | 59 | |
|---|---|---|---|

1 mark

**5** Here are five numbers.

| ~~2~~ | 4 | 6 | 8 | 13 |

Write each number on all of the relevant cards. One has been done for you.

| Prime numbers | Factors of 24 | Factors of 16 |
|---|---|---|
| 2 | 2 | 2 |

2 marks

**6** A cafe sells different cupcakes.

vanilla £2.00    chocolate £2.25    blueberry £2.40

Hari buys 5 vanilla and 2 blueberry.
a) How much does he pay altogether?

show your method

£

2 marks

**Buy 10 cupcakes and get an eleventh cupcake, of the same flavour, for half of the full price.**

1 mark

b) Abi buys 10 blueberry cupcakes in the special offer.
How much does she pay altogether for all 11 cupcakes?

£

/10

TOTAL

# PROGRESS TRACKER

Write your scores from each concept in this unit to track your progress.

| | |
|---|---|
| Written Addition | / 6 |
| Written Subtraction | / 7 |
| Written Multiplication | / 7 |
| Written Division | / 7 |
| Solving Missing Digit Problems | / 10 |
| Solving Multi-Step Problems | / 6 |
| Multiplying and Dividing by 10, 100 and 1000 | / 8 |
| Multiplying and Dividing Decimals by Integers | / 8 |
| Order of Operations (BIDMAS) | / 9 |
| Multiples and Factors | / 10 |
| Estimating and Inverse | / 7 |
| Prime Numbers to 100 | / 6 |
| Square and Cube Numbers | / 7 |
| Addition, Subtraction, Multiplication and Division Mixed Practice | / 10 |
| **TOTAL** | / 108 |

# SELF-REFLECTION

What went well:

_____

_____

My target to improve:

_____

_____

# RECHARGE

Solve the calculations to reveal the hidden picture. Use the key to colour in each box.

| White | Red | Yellow | Orange | Blue |
|---|---|---|---|---|
| 1 - 5 | 6 - 10 | 11 - 20 | 21 - 40 | 41 - 144 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 4 × 11 | 8 × 10 | 3 × 3 | 9 × 10 | 5 × 9 | 12 × 10 | 12 × 9 | 9 × 7 | 6 × 11 |
| 6 × 12 | 11 × 6 | 8 × 8 | 45 ÷ 5 | 18 ÷ 3 | 12 × 4 | 7 × 12 | 7 × 3 | 11 × 9 |
| 9 × 9 | 6 × 7 | 12 × 5 | 6 × 6 | 2 × 3 | 6 × 10 | 11 × 8 | 6 × 8 | 9 × 12 |
| 7 × 10 | 9 × 6 | 11 × 5 | 4 × 2 | 7 × 5 | 42 ÷ 6 | 49 ÷ 7 | 8 × 9 | 7 × 7 |
| 11 × 11 | 5 × 9 | 30 ÷ 5 | 63 ÷ 7 | 8 × 4 | 6 × 4 | 3 × 3 | 48 ÷ 8 | 12 × 10 |
| 8 × 6 | 2 × 5 | 40 ÷ 4 | 11 × 2 | 1 × 11 | 12 × 2 | 9 × 3 | 36 ÷ 6 | 9 × 8 |
| 11 × 4 | 63 ÷ 9 | 5 × 5 | 10 × 3 | 4 × 3 | 77 ÷ 7 | 3 × 11 | 84 ÷ 12 | 5 × 11 |
| 5 × 12 | 21 ÷ 3 | 4 × 10 | 7 × 2 | 84 ÷ 7 | 3 × 5 | 4 × 4 | 63 ÷ 9 | 12 × 12 |
| 9 × 11 | 42 ÷ 7 | 99 ÷ 11 | 2 × 10 | 6 × 3 | 21 ÷ 7 | 99 ÷ 9 | 56 ÷ 8 | 9 × 5 |
| 7 × 8 | 12 × 6 | 96 ÷ 12 | 24 ÷ 4 | 18 ÷ 9 | 10 ÷ 5 | 81 ÷ 9 | 7 × 11 | 12 × 8 |
| 8 × 12 | 6 × 9 | 11 × 7 | 7 × 9 | 11 × 12 | 12 × 7 | 8 × 7 | 4 × 12 | 7 × 6 |

# SIMPLIFYING FRACTIONS

## SUPERCHARGE!

SCORE: [ /8 ]

Write all of the **factors** of 12 and 18 in the correct sections.

b) Common Factors

a) Factors of 12

c) Factors of 18
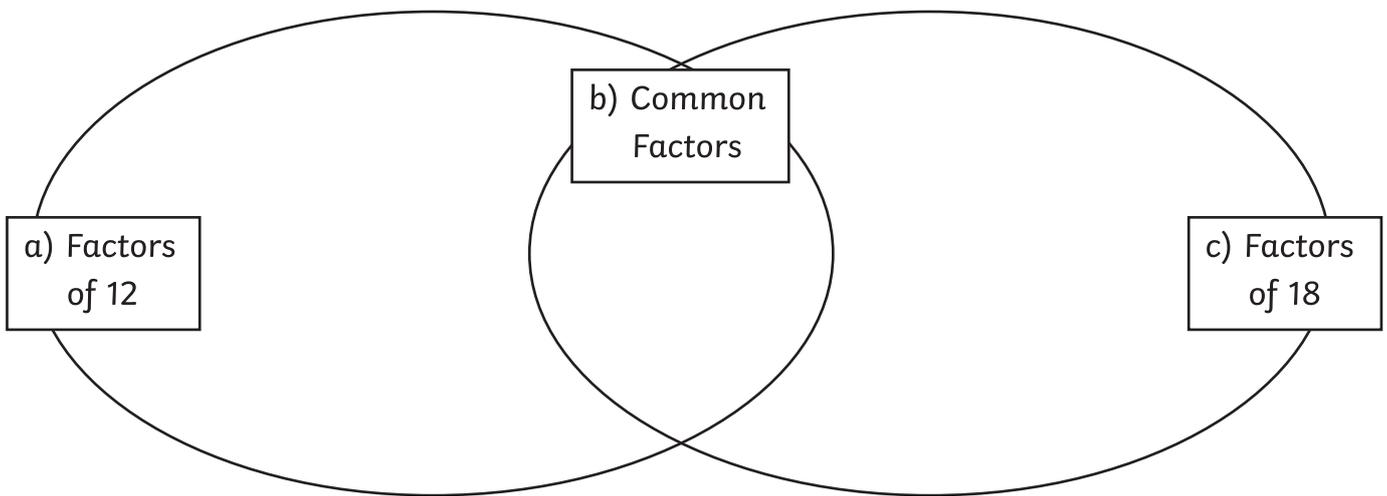
## BOOST YOUR SUPERPOWERS

When we **simplify a fraction**, we use the **highest common factor** of the numerator and denominator to express a fraction in its simplest form. In this example, we find the **highest common factor** of 9 and 12 which is 3.

Factors of 9:
1, **3**, 9
Factors of 12:
1, 2, **3**, 4, 6, 12

$\frac{9}{12}$

$$\frac{9}{12} = \frac{3}{4}$$

$\div 3$ (top)
$\div 3$ (bottom)
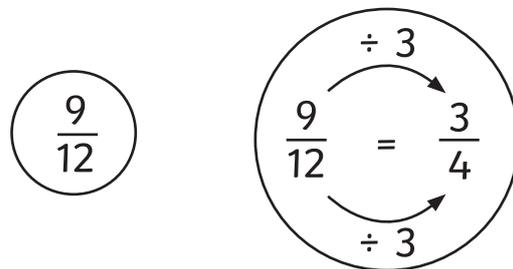
Next, we **divide** the **numerator** and **denominator** by their highest common factor.

SCAN ME
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The simplest form of $\frac{9}{12}$ is $\frac{3}{4}$

**1** Write each fraction in its **simplest** form.

a) $\dfrac{36}{48} = \dfrac{\square}{\square}$

b) $\dfrac{14}{49} = \dfrac{\square}{\square}$

c) $\dfrac{21}{27} = \dfrac{\square}{\square}$

2 marks

**2** **Match** the fractions in the bottom row with their **simplest form equivalent** in the top row.

| $\dfrac{2}{3}$ | $\dfrac{1}{4}$ | $\dfrac{8}{9}$ | $\dfrac{4}{15}$ |
|---|---|---|---|

| $\dfrac{8}{32}$ | $\dfrac{12}{18}$ | $\dfrac{12}{45}$ | $\dfrac{16}{18}$ |
|---|---|---|---|

2 marks

**3** Sort these fractions into the table according to whether they are expressed in their **simplest form** or not.

$\dfrac{5}{8}$  $\dfrac{4}{20}$  $\dfrac{17}{23}$  $\dfrac{5}{12}$  $\dfrac{7}{21}$  $\dfrac{11}{30}$

| Fractions in their simplest form | Fractions <u>not</u> in their simplest form |
|---|---|
| | |

2 marks

**4** Simplify these fractions.

Put them in order from **smallest to greatest** in their **simplest form**.

$$\frac{9}{36} \qquad \frac{4}{40} \qquad \frac{5}{25} \qquad \frac{6}{36} \qquad \frac{115}{230} \qquad \frac{28}{84}$$

smallest                                                                        largest

2 marks

**5** Amrit says,

> I can simplify a fraction by halving the numerator and denominator.

AMRIT

Is Amrit's statement always true, sometimes true or never true?

**Circle** your answer.

always        sometimes        never

Explain your answer.
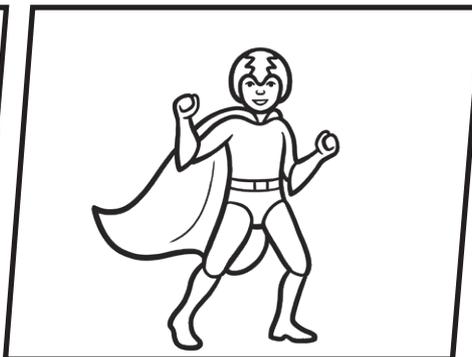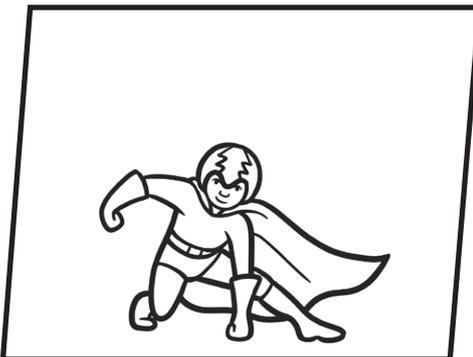
1 mark

/9

**TOTAL**

## MISSION COMPLETE!

### How confident do you feel?

# INTERACTIVE GAME

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**SCAN ME**

# NOTES

# WORKING OUT

## SUPERCHARGE!

**Maths Riddle**

Write a calculation using the digits 1, 2, 3, 4 and 5 once and the operations × and ÷ once. What is the smallest whole number you can get as an answer?

Answers: 13 × 4 ÷ 52 = 1

## BOOST YOUR SUPERPOWERS

**Improper Fractions to Mixed Numbers**

We **divide** the **numerator** by the **denominator**. This tells us how many wholes we have and how many parts we have left.

The denominator stays the same.

$\frac{13}{5}$

$13 ÷ 5 = 2r3$ (2 wholes and 3 parts)

$\frac{13}{5}$ = **2 $\frac{3}{5}$**

**Mixed Numbers to Improper Fractions**

We **multiply** the **denominator** by the **whole number** to find how many parts this is equal to. Then, we **add** this to the remaining fraction.

$2\frac{5}{6}$

$2 × 6 = 12$

2 wholes = $\frac{12}{6}$

$$\frac{12}{6} + \frac{5}{6} = \frac{17}{6}$$

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**1** Convert the fractions and mixed numbers.

a)  $\boxed{\phantom{0}}\dfrac{\boxed{\phantom{0}}}{\boxed{\phantom{0}}} = \dfrac{19}{4}$

b)  $\dfrac{35}{6} = \boxed{\phantom{0}}\dfrac{\boxed{\phantom{0}}}{\boxed{\phantom{0}}}$

c)  $8\dfrac{2}{7} = \dfrac{\boxed{\phantom{0}}}{\boxed{\phantom{0}}}$

d)  $\dfrac{\boxed{\phantom{0}}}{\boxed{\phantom{0}}} = 5\dfrac{7}{9}$

**2 marks**

**2** Use **all** the digit cards to show a conversion from an improper fraction to a mixed number.

Each card should be used only **once**.

$\boxed{1}\ \boxed{2}\ \boxed{2}\ \boxed{2}\ \boxed{5}\ \boxed{5}$

$$\dfrac{\boxed{\phantom{0}}\,\boxed{\phantom{0}}}{\boxed{\phantom{0}}} = \boxed{\phantom{0}}\dfrac{\boxed{\phantom{0}}}{\boxed{\phantom{0}}}$$
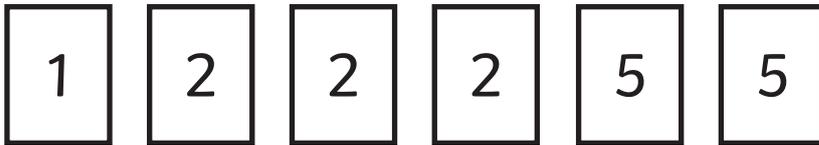
**1 mark**

**3** Write the missing digits.

One has been done for you.

| Improper fraction | Mixed number |
| --- | --- |
| $\dfrac{23}{6}$ | $3\dfrac{5}{6}$ |
| $\dfrac{\square}{3}$ | $2\dfrac{2}{3}$ |
| $\dfrac{21}{6}$ | $3\dfrac{\square}{6}$ |
| $\dfrac{20}{8}$ | $\square\dfrac{4}{8}$ |

**4** Use **<**, **>** or **=** to make the statements true.

a) $2\dfrac{5}{6}$ □ $\dfrac{15}{6}$

b) $4\dfrac{1}{4}$ □ $\dfrac{17}{4}$

c) $5\dfrac{2}{5}$ □ $\dfrac{2}{5}$

d) $6\dfrac{2}{3}$ □ $\dfrac{18}{3}$

# MISSION COMPLETE!

How confident do you feel?

# NOTES

# WORKING OUT

## SUPERCHARGE!

SCORE: ☐ /6

Write the fractions in the correct column.

| Simplest form | Not in its simplest form |
|---|---|
|  |  |

a) $\dfrac{28}{32}$       b) $\dfrac{16}{15}$

c) $\dfrac{6}{15}$       d) $\dfrac{4}{15}$

e) $\dfrac{15}{21}$       f) $\dfrac{7}{9}$

## BOOST YOUR SUPERPOWERS

**Equivalent fractions** are fractions that are **equal in value** despite having different numerators and denominators. To find equivalent fractions, we **multiply or divide** the numerator and denominator by the same number. For example,

$\times 5$

$\dfrac{1}{2} = \dfrac{5}{10}$

$\times 5$

$\div 3$

$\dfrac{9}{12} = \dfrac{3}{4}$

$\div 3$

REVISION VIDEO

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**1** Here are some shapes.

**Tick** (✓) the shapes that are equivalent to $\frac{2}{3}$
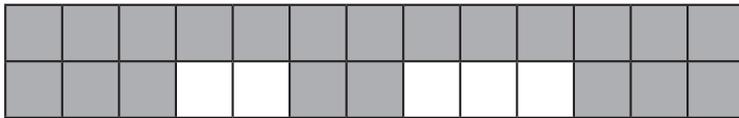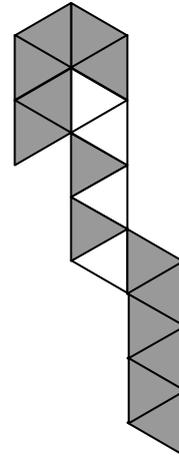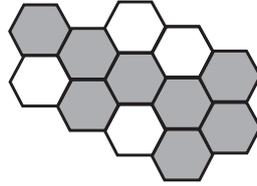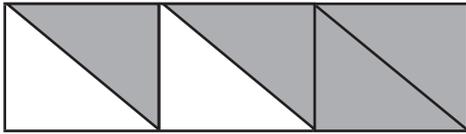
1 mark

**2** Write in the missing values to make these fractions equivalent.

$$\frac{3}{\square} = \frac{9}{12} = \frac{\square}{48}$$

2 marks

**3** Look at the fractions represented in these shapes.
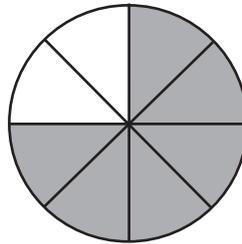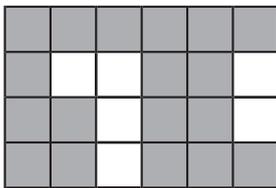
Felix says,

> The two fractions shown cannot be equivalent because they are different shapes.

**FELIX**

Do you agree with Felix? Circle **Agree** or **Disagree**.

Explain your answer.

1 mark

**4** Here are five fractions.

a) Circle **all** the **improper** fractions.

$$\frac{13}{2} \qquad \frac{10}{15} \qquad \frac{6}{5} \qquad \frac{4}{2} \qquad \frac{2}{3}$$

☐
1 mark

b) Which fraction is equivalent to $2\frac{3}{5}$?

☐
1 mark

c) Which two fractions are equivalent? ☐ and ☐
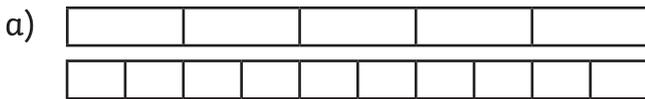
☐
1 mark

/7
**TOTAL**

# MISSION COMPLETE!



## How confident do you feel?

## INTERACTIVE GAME

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## NOTES

## WORKING OUT

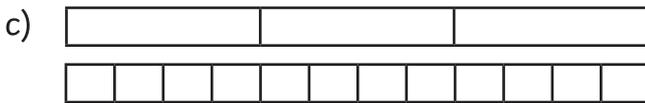# COMPARING AND ORDERING FRACTIONS

## SUPERCHARGE!

Shade the fraction bars to represent each fraction. Then, compare the fractions using <, > or =.

a)

$$\frac{4}{5} \ \square \ \frac{7}{10}$$

b)

$$\frac{6}{9} \ \square \ \frac{2}{3}$$

c)

$$\frac{1}{3} \ \square \ \frac{3}{12}$$

d)
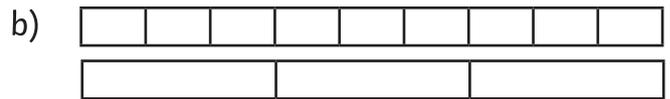
$$\frac{2}{8} \ \square \ \frac{4}{12}$$

Answers: a) > b) = c) > d) <

## BOOST YOUR SUPERPOWERS

One way of comparing fractions that have different denominators is by **converting** each fraction into an **equivalent fraction**, using the l**owest common multiple** of the denominators.

Multiples of 5: 5, 10, 15, → $\frac{3}{5}$ and $\frac{2}{3}$ ← Multiples of 3: 3, 6, 9, 12, 15

$$\frac{3}{5} \overset{\times 3}{\underset{\times 3}{=}} \frac{9}{15}$$

$$\frac{9}{15} < \frac{10}{15} \quad \text{so} \quad \frac{3}{5} < \frac{2}{3}$$

$$\frac{2}{3} \overset{\times 5}{\underset{\times 5}{=}} \frac{10}{15}$$

If we are comparing fractions that have the **same numerator**, the **greater** the **denominator**, the **smaller** the value of the **fraction**. This is because the **whole** has been divided into a **greater number** of **equal parts**.

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$$\frac{4}{7} > \frac{4}{9}$$

# MATHS MISSION

**1** Write the correct sign  <, = or > in each box to make these statements correct.

$$\frac{2}{3} \square \frac{6}{10} \qquad \frac{5}{7} \square \frac{3}{4} \qquad \frac{8}{16} \square \frac{6}{12} \qquad \frac{4}{9} \square \frac{5}{11}$$

2 marks

**2** Elena and Bartek are reading the same book.

Elena has read $\frac{7}{9}$ of the book and Bartek has read $\frac{6}{8}$ of the book.

Who has read the **most** pages?

**Explain** your reasoning.

1 mark

**3** Write these fractions in order of size, starting with the **greatest**.

$$\frac{3}{7} \qquad \frac{3}{4} \qquad \frac{3}{9} \qquad \frac{3}{6} \qquad \frac{3}{2}$$

greatest                                                                          smallest

1 mark

Here are four fraction cards.

$$\frac{4}{7} \qquad \frac{3}{5} \qquad \frac{5}{10} \qquad \frac{6}{14}$$

Use any **three** of the cards to make this statement correct.

☐ < ☐ < ☐

1 mark

5  Write a digit in each box so that the fractions are arranged in order from **smallest to greatest**.

$$\frac{2}{9} \qquad \frac{\square}{3} \qquad \frac{1}{\square} \qquad \frac{5}{8} \qquad \frac{3}{\square}$$

smallest                                        greatest

2 marks

/ 7

**TOTAL**

# MISSION COMPLETE!

## How confident do you feel?

# INTERACTIVE GAME

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# NOTES

# WORKING OUT

## SUPERCHARGE!

a) Colour in all the factors of 24

| 12 | 1 | 9 | 8 |
|----|----|----|----|
| 3 | 11 | 10 | 15 |
| 7 | 13 | 24 | 16 |
| 18 | 14 | 20 | 4 |

b) Colour in all the factors of 42

| 40 | 32 | 42 | 8 |
|----|----|----|----|
| 6 | 13 | 9 | 7 |
| 16 | 20 | 14 | 15 |
| 21 | 38 | 10 | 11 |

**Answers: a)** 12, 1, 8, 3, 24, 4    **b)** 42, 6, 7, 14, 21

## BOOST YOUR SUPERPOWERS

**Adding and Subtracting Fractions with Different Denominators**

We need to convert both fractions so that they have a **common denominator**. We use the **lowest common multiple** to create **equivalent fractions** which we can then add and subtract.

$$\frac{2}{7} + \frac{3}{5} =$$

$$\frac{2}{7} \overset{\times 5}{\underset{\times 5}{=}} \frac{\mathbf{10}}{\mathbf{35}} \qquad \frac{3}{5} \overset{\times 7}{\underset{\times 7}{=}} \frac{\mathbf{21}}{\mathbf{35}} \qquad \frac{10}{35} + \frac{21}{35} = \frac{\mathbf{31}}{\mathbf{35}}$$

**Multiples of 7**:
7, 14, 21, 28, $\underline{35}$
**Multiples of 5**:
5, 10, 15, 20, 25, 30, $\underline{35}$
The **LCM** is $\underline{35}$

**Adding and Subtracting Mixed Fractions**

There are two methods you can use:

1) Add/subtract the fractions and whole numbers **separately**.

$$2\frac{1}{2} - 1\frac{1}{4} \qquad 2 - 1 = 1 \qquad \frac{1}{2} = \frac{2}{4} \qquad \frac{2}{4} - \frac{1}{4} = \frac{1}{4} \qquad 1 + \frac{1}{4} = \boxed{1\frac{1}{4}}$$

**Adding and Subtracting Mixed Fractions**

2) Convert the mixed fractions to **improper fractions**.

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$$2\frac{2}{5} + 1\frac{3}{10} \qquad 2\frac{2}{5} = \frac{12}{5} = \frac{24}{10} \qquad 1\frac{3}{10} = \frac{13}{10} \qquad \frac{24}{10} + \frac{13}{10} = \frac{37}{10} = 3\frac{7}{10}$$
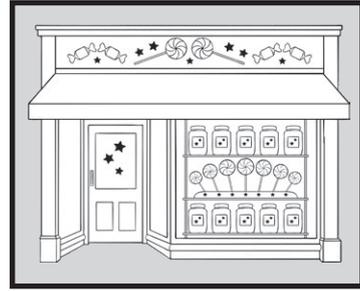
**1** Hari walked $2\frac{1}{3}$ km to the park.

He then walked a **further** $\frac{1}{2}$ km to the shops.

How far did Hari walk **altogether**?

Write your answer as a fraction.

km

1 mark

**2** Match the calculations to the correct answers.

| | |
|---|---|
| $\frac{1}{8} + \frac{3}{4}$ | $\frac{1}{6}$ |
| $\frac{2}{3} - \frac{1}{2}$ | $\frac{17}{20}$ |
| $\frac{3}{5} + \frac{1}{4}$ | $\frac{7}{12}$ |
| $\frac{5}{6} - \frac{1}{4}$ | $\frac{7}{8}$ |

2 marks

**3** Look at these numbers.

| $23\frac{3}{4}$ | $\frac{22}{4}$ | $16\frac{1}{4}$ | $\frac{25}{4}$ | $5$ | $\frac{45}{4}$ |

Which two of these numbers add up to 30?     and

1 mark

Which two of these numbers have a difference of 5?     and

1 mark

**4** Complete the table to show whether **each** calculation is correct or incorrect.

If the calculation is incorrect, write the correct answer.

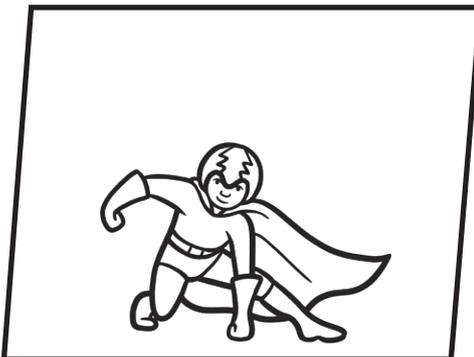| | Correct (✓) or incorrect (✗)? | Correct answer |
|---|---|---|
| $\frac{1}{3} + \frac{6}{9} = \frac{7}{9}$ | | |
| $\frac{2}{5} - \frac{1}{3} = \frac{1}{15}$ | | |
| $\frac{2}{3} - \frac{1}{4} - \frac{1}{6} = \frac{1}{4}$ | | |
| $\frac{4}{5} - \frac{1}{4} - \frac{1}{2} = \frac{2}{20}$ | | |

2 marks

/ 7

**TOTAL**

## MISSION COMPLETE!

### How confident do you feel?

## INTERACTIVE GAME

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## NOTES

## WORKING OUT
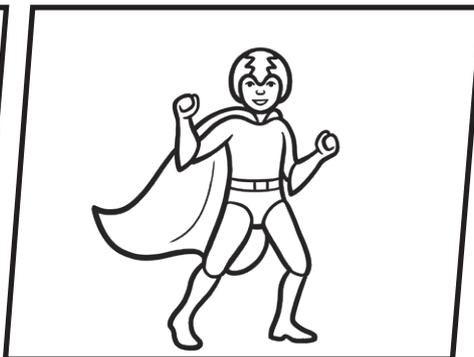
# MULTIPLYING FRACTIONS

## SUPERCHARGE!

Answer the calculations below and find the answers in the word search.

a) 7 × 3 =

b) 6 × 9 =

c) 3 × 12 =

d) 4 × 3 =

e) 2 × 5 =

f) 10 × 9 =

| r | u | o | r | k | l | f | b | x | t |
|---|---|---|---|---|---|---|---|---|---|
| n | f | a | s | t | c | b | c | r | h |
| i | e | i | t | s | v | c | i | q | i |
| n | e | p | f | e | z | i | g | h | r |
| e | t | w | u | t | n | f | v | h | t |
| t | w | e | n | t | y | o | n | e | y |
| y | e | b | l | f | q | f | d | l | s |
| n | l | z | l | w | h | w | o | y | i |
| j | v | k | t | d | c | e | z | u | x |
| k | e | k | e | r | w | k | c | g | r |

Answers: a) twenty-one b) fifty-four c) thirty-six d) twelve e) ten f) ninety

## BOOST YOUR SUPERPOWERS

To multiply a fraction by an integer, we multiply the **numerator** by the **integer** because multiplication is the same as **repeated addition**. Then, we can **convert** the answer to a mixed number.

$$4 \times \frac{2}{5} = \frac{2}{5} + \frac{2}{5} + \frac{2}{5} + \frac{2}{5}$$

$$4 \times \frac{2}{5} = \frac{8}{5} = \mathbf{1\frac{3}{5}}$$

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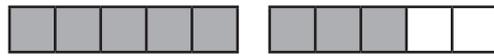
We can multiply a **mixed number** by an **integer** by **partitioning**...

$$4\frac{1}{3} \times 2 = (4 \times 2) + \left(\frac{1}{3} \times 2\right) = \mathbf{8\frac{2}{3}}$$

...or by **converting** it to an **improper fraction** first.

$$5\frac{3}{4} \times 3 = \frac{23}{4} \times 3 = \frac{69}{4} = \mathbf{17\frac{1}{4}}$$

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To **multiply** two proper fractions, we **multiply** the **numerators** and then multiply the **denominators**. We can then **simplify** the answer if needed.
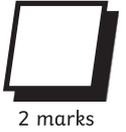
$$\frac{2}{5} \times \frac{5}{8} = \frac{10}{40} = \mathbf{\frac{1}{4}}$$

**1**    Write in the missing fractions.

a)   $\dfrac{4}{7} \times \boxed{\phantom{0}} = \dfrac{20}{63}$        b)   $\dfrac{3}{5} \times \boxed{\phantom{0}} = \dfrac{2}{5}$

2 marks

**2**    Drew's hair was $\dfrac{1}{6}$m long.

Drew went for a haircut and the hairdresser cut off $\dfrac{2}{7}$ of their hair.

As a **fraction** of a metre, how long is Drew's hair after the haircut?

$\boxed{\phantom{XXXXXXXXXXX} \text{m}}$

1 mark

**3**    How many quarters are there in 13?    $\boxed{\phantom{XXXXXXXXX}}$

1 mark

**4**    Elias has these six digit cards.

$\boxed{1}$   $\boxed{2}$   $\boxed{3}$   $\boxed{4}$   $\boxed{5}$   $\boxed{6}$

He uses four of the digit cards to make **two fractions.**

He **multiplies** these fractions together and gets an answer.

What is the **greatest** possible answer that Elias could get by using these digit cards?

He only uses each card once.

$\dfrac{\boxed{\phantom{0}}}{\boxed{\phantom{0}}} \times \dfrac{\boxed{\phantom{0}}}{\boxed{\phantom{0}}} = \boxed{\phantom{0}}$

2 marks
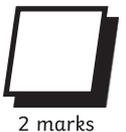
**5** Zeke is sharing a pizza with Jia.



> **ZEKE**
>
> Three-quarters of half a pizza is more than half of three-quarters of a pizza because you get a bigger fraction.

Is Zeke correct? Circle **Yes** or **No**.
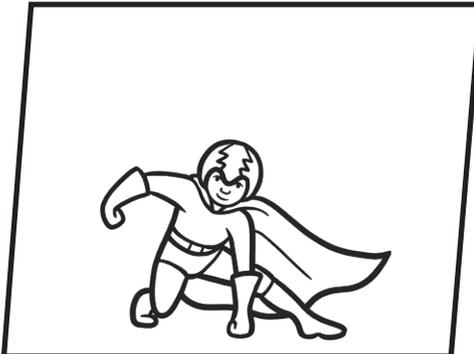
Yes / No

**Explain** your answer.
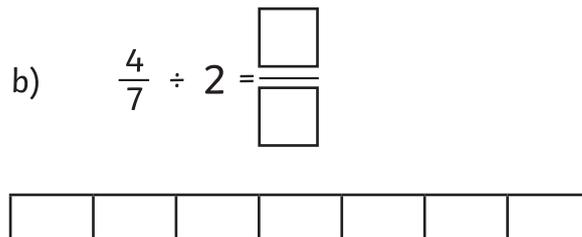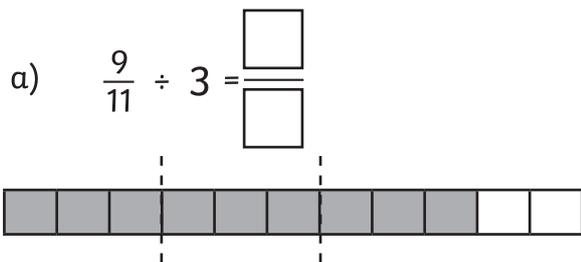
1 mark

/ 7

**TOTAL**

# MISSION COMPLETE!



## How confident do you feel?

# INTERACTIVE GAME

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# NOTES

# WORKING OUT

# DIVIDING FRACTIONS

## SUPERCHARGE!

Shade the bar models to help you answer these calculations.
The first one has been partially done for you.

a) $\dfrac{9}{11} \div 3 = \dfrac{\square}{\square}$

b) $\dfrac{4}{7} \div 2 = \dfrac{\square}{\square}$

Answers: a) $\dfrac{3}{11}$   b) $\dfrac{2}{7}$

## BOOST YOUR SUPERPOWERS

To **divide** a proper fraction by a **whole number**, we write the whole number with a **denominator of 1**.

$$\frac{1}{4} \div 5 = \frac{1}{4} \div \frac{5}{1}$$

Then, we invert (flip) **the second fraction and multiply** because division is the **inverse** of multiplication.

$$\times \longleftrightarrow \div$$

$$\frac{1}{4} \div \frac{5}{1} = \frac{1}{4} \times \frac{1}{5} = \frac{1}{20}$$

In this example, to **divide by 5**, we can **multiply by one-fifth**.

REVISION VIDEO  SCAN ME
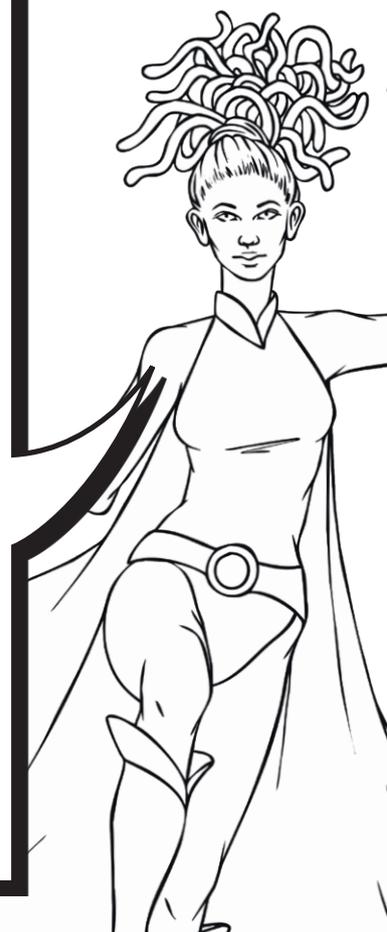
**1** Write each fraction in its **simplest** form.

a) $\dfrac{4}{5} \div 3 = \boxed{\phantom{XX}}$

b) $\dfrac{5}{8} \div \boxed{\phantom{XX}} = \dfrac{5}{32}$

2 marks

**2** $\dfrac{3}{7}$ of the circle is shaded.
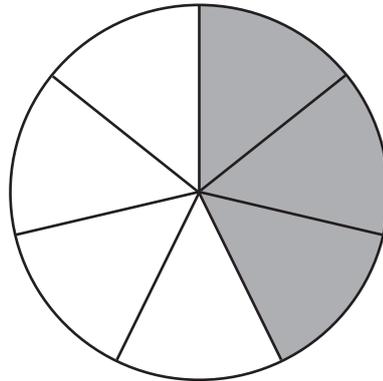
What fraction of the circle is **one white** part? $\boxed{\phantom{XX}}$

1 mark

**3** Priya says,

**PRIYA**

$\dfrac{6}{15} \div 3 = \dfrac{2}{5}$

Priya is not correct.

**Explain** Priya's mistake.

1 mark

**4** Use **<** , **>** or **=** to compare the calculations.

$$\frac{3}{7} \div 4 \quad \boxed{\phantom{<}} \quad \frac{3}{10} \div 2$$

**5** A heatwave left puddles of melted ice in the Ice Caves.

Some of the Maths Heroes worked together to mop up the water.



The Fraction Flame mopped up $\frac{2}{5}$ of the volume of water.

Four other Maths Heroes all mopped up an **equal** amount of the rest of the water.

What fraction of the volume of water did **each** of the other four Maths Heroes mop up?

show your method

/ 7

**TOTAL**

## MISSION COMPLETE!



### How confident do you feel?

# INTERACTIVE GAME

Scan this QR code to access a Twinkl Go! Game to further practise your maths skills.

**SCAN ME**

# NOTES

# WORKING OUT

# FRACTIONS OF AMOUNTS

## SUPERCHARGE!

Draw lines to match the equivalent values.

a) $\frac{1}{4}$ of 28    b) $\frac{1}{3}$ of 27    c) $\frac{1}{5}$ of 30    d) $\frac{1}{3}$ of 24    e) $\frac{1}{2}$ of 20

| 6 | 7 | 8 | 9 | 10 |

Answers: a) 7 b) 9 c) 6 d) 8 e) 10

## BOOST YOUR SUPERPOWERS

To find a **fraction of an amount**, we divide the amount by the **denominator** and **multiply** the answer by the **numerator.**

$\frac{2}{3}$ of 270

| 270 | | |
|---|---|---|

270 ÷ **3** = 90          90 × **2 = 180**

We can also find the value of the **whole** from a given answer. We **divide** the **given answer** by the **numerator** to find the value of one part. Then, we **multiply** the value of **one part** by the **denominator**.

$\frac{3}{5}$ of ☐ = 51

| 51 | | | | |
|---|---|---|---|---|
| 17 | 17 | 17 | 17 | 17 |

$\frac{1}{5}$ of ☐ = 51 ÷ **3** = 17        17 × **5 = 85** = $\frac{5}{5}$

REVISION VIDEO

SCAN ME

**1** Complete the calculations.

a) $\frac{3}{4}$ of 284 = ⬚

b) $\frac{7}{8}$ of ⬚ =560

**2** Emily is thinking of a number.

Emily says,

**EMILY**

$\frac{4}{5}$ of my number is 80

**FELIX**

Emily's number is 64 because 80 ÷ 5 = 16 and 16 × 4 = 64

**HARI**

Emily's number is 100 because 80 divided by 4 is 20 and 20 multiplied by 5 is 100

Explain Felix's mistake.

1 mark

**3** Elias has 282 building bricks.
He has used $\frac{1}{6}$ of the building bricks in his model.
How many building bricks does Elias have **left**?

show your method

bricks

**4** Abi spent £1.85 on her bus fare and £2.65 on her lunch.
She has **three-quarters** of her weekly allowance **left**.
How much is Abi's **total** weekly allowance?

show your method

£

/ 7

**TOTAL**

## MISSION COMPLETE!

### How confident do you feel?

# INTERACTIVE GAME

Scan this QR code to access a Twinkl Go! Game to further practise your maths skills.

**SCAN ME**

# NOTES

# WORKING OUT

## SUPERCHARGE!

Fill in the missing values to make fractions equivalent to the one in the centre.

a)

$\dfrac{5}{\square}$   $\dfrac{8}{\square}$

$\dfrac{\square}{12}$   $\dfrac{1}{4}$   $\dfrac{\square}{28}$

$\dfrac{6}{\square}$   $\dfrac{\square}{36}$

b)

$\dfrac{\square}{24}$   $\dfrac{\square}{9}$

$\dfrac{5}{\square}$   $\dfrac{1}{3}$   $\dfrac{\square}{21}$

$\dfrac{\square}{18}$   $\dfrac{4}{\square}$

Answers: a) $\dfrac{8}{32}$ $\dfrac{7}{28}$ $\dfrac{9}{36}$ $\dfrac{6}{24}$ $\dfrac{3}{12}$ $\dfrac{5}{20}$   b) $\dfrac{3}{9}$ $\dfrac{7}{21}$ $\dfrac{4}{12}$ $\dfrac{6}{18}$ $\dfrac{5}{15}$ $\dfrac{8}{24}$
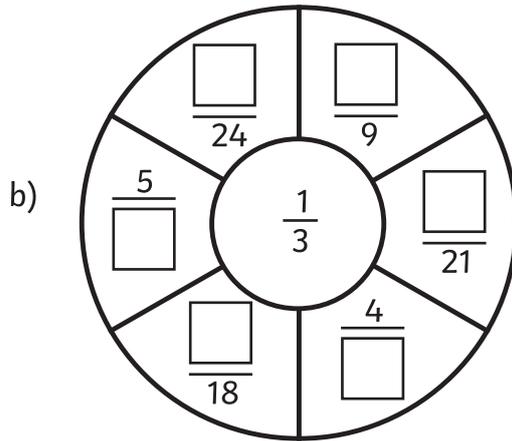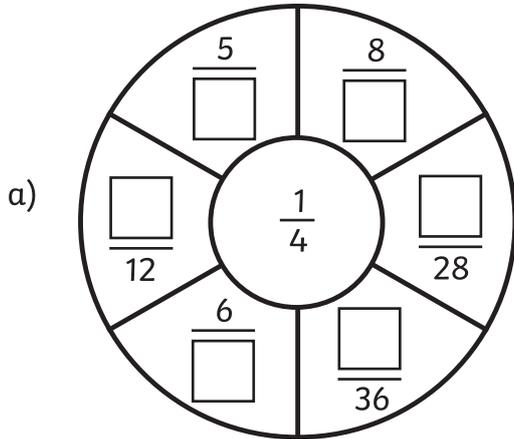
## BOOST YOUR SUPERPOWERS

**Fraction to Decimal**
Divide the numerator by the denominator.

$\dfrac{3}{5}$ Fraction

$\dfrac{3}{5}$ = 3 ÷ 5 = 0.6

0.6 Decimal

**Decimal to Percentage**

Multiply the decimal by 100. Make sure to use the percent symbol.
0.6 × 100 = 60%
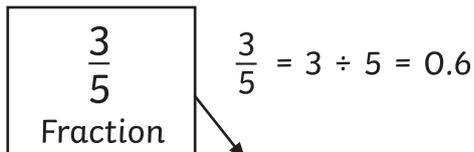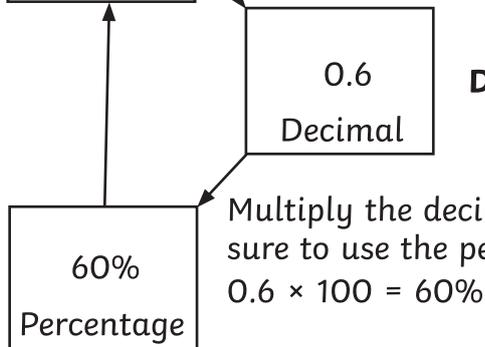
60% Percentage

**Percentage to Fraction**

Write the percentage as a fraction with a denominator of 100 and simplify.

$\dfrac{60}{100}$ = $\dfrac{6}{10}$ = $\dfrac{3}{5}$

REVISION VIDEO ▶ SCAN ME
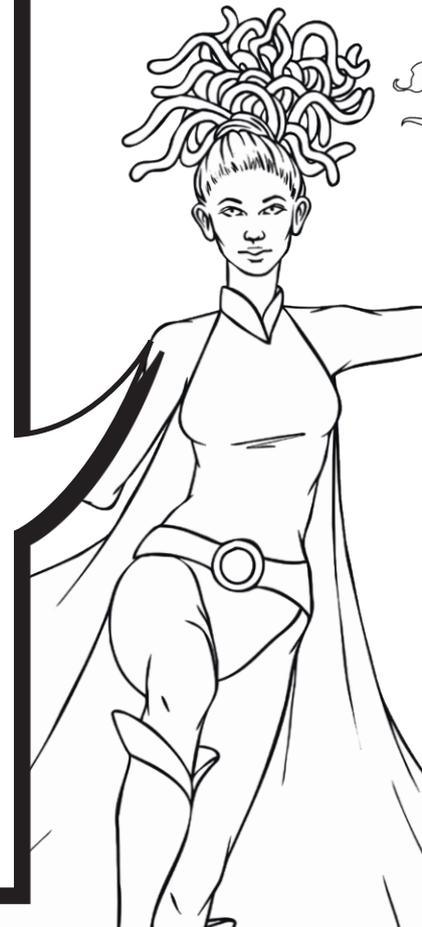
**1** Put a tick (✓) in **each row** to complete this table.

| | Greater than $\frac{1}{4}$ | Less than $\frac{1}{4}$ |
|---|---|---|
| 0.3 | | |
| 14% | | |
| $\frac{4}{12}$ | | |
| 0.21 | | |

2 marks

**2** Circle the **two** fractions that are equivalent to 0.8

$\frac{8}{10}$    $\frac{1}{80}$    $\frac{10}{80}$    $\frac{8}{100}$    $\frac{4}{5}$

1 mark

**3** Priya says,

PRIYA

0.45 is greater than $\frac{4}{5}$

**Explain** why Priya is not correct.

1 mark

**4** Use <, > or = to make these statements correct.

82% ☐ 0.8

0.12 ☐ $\frac{12}{1000}$

**5** Write in the missing values.

$0.91 = \dfrac{\boxed{\phantom{000}}}{1000}$ $\qquad$ $1.168 = \dfrac{\boxed{\phantom{000}}}{1000}$

$\boxed{\phantom{000}} = \dfrac{104}{1000}$ $\qquad$ $\boxed{\phantom{000}} = \dfrac{73}{1000}$

# MISSION COMPLETE!



## How confident do you feel?

# INTERACTIVE GAME

Scan this QR code to access a Twinkl Go! Game to further practise your maths skills.

**SCAN ME**

# NOTES

# WORKING OUT

## SUPERCHARGE!

Complete the table to find 50%, 25% and 10% of these amounts.

| Amount | 50% | 25% | 10% |
|--------|-----|-----|-----|
| 100 | 50 | a) | b) |
| 20 | c) | d) | 2 |
| 160 | e) | 40 | f) |
| 24 | 12 | g) | h) |

Complete the table to find 20%, 10% and 1% of these amounts.

$\times 2 \qquad \div 10$

| Amount | 20% | 10% | 1% |
|--------|-----|-----|-----|
| 400 | i) | 40 | j) |
| 2500 | k) | 250 | i) |
| 60 | 12 | m) | n) |
| 350 | o) | p) | 3.5 |

**Answers:** a) 25 b) 10 c) 10 d) 5 e) 80 f) 16 g) 6 h) 2.4 i) 80 j) 4 k) 500 l) 25 m) 25 n) 0.6 o) 70 p) 35

## BOOST YOUR SUPERPOWERS

One way of calculating a percentage of an amount is to **convert** the percentage to an **equivalent fraction**, e.g. **50%** of 18 = $\frac{1}{2}$ of 18 = **9**  **10%** of 30 = $\frac{1}{10}$ of 30 = **3**

To find more complex percentages of amounts, we can use **multiples** of our known percentages.

| 100% | | | | | | | | | |
|------|------|------|------|------|------|------|------|------|------|
| 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% |

30%

For example, **30%** of 15
= (**10%** of 15) × 3   = 1.5 × 3  = 4.5
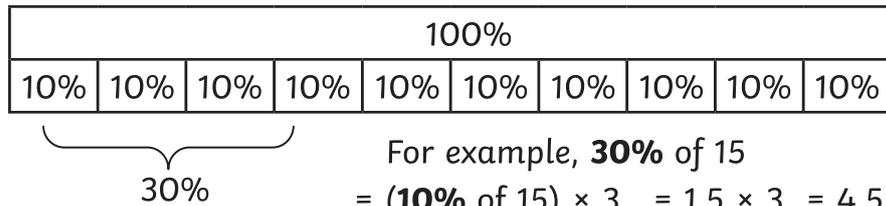
We can also break complex percentage calculations down into easier steps.

**45%** of 80 = **50% − 5%** = 40 − 4 = 36

If we know the value of a percentage of an amount, we can use this to calculate the **whole amount** e.g.

75% of ☐ = 165

| 100% | | | |
|------|------|------|------|
| 25% | 25% | 25% | 25% |

165
165 ÷ 3 = 55 = 25%         55 × 4 = **220**
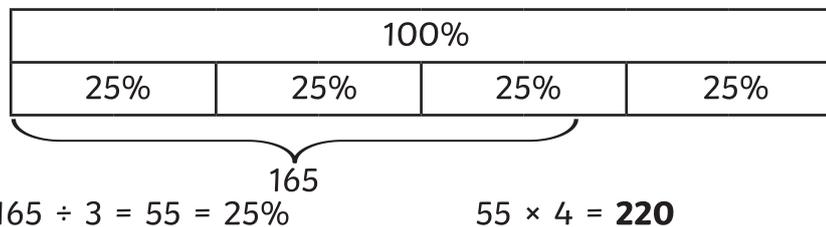
# MATHS MISSION

**1** Calculate 55% of 480 [ ]
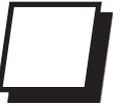
1 mark

**2** Calculate 19% of 4500 [ ]

1 mark

**3** Emily took part in a maths quiz which had 25 questions.

**EMILY**

I answered 50% of the questions.

**Explain** why Emily cannot be correct.

[ ]

1 mark

**4** Amrit and her friends made 140 cupcakes for a bake sale. She sold 75% of the **cupcakes**.
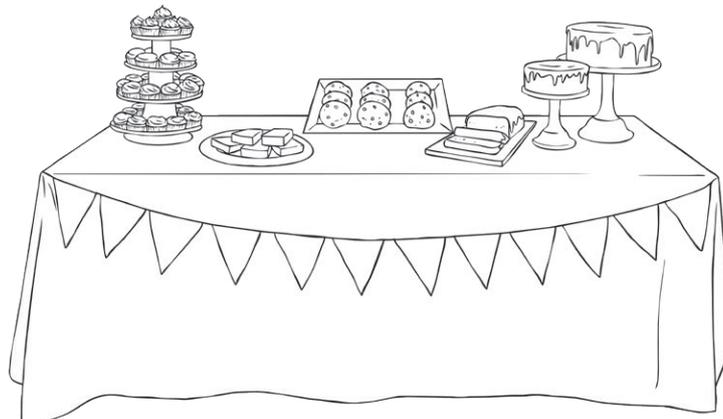
How many cupcakes did Amrit sell? [ ] cupcakes

1 mark

Fractions, Decimals and Percentages    **128**

**5** The Fraction Flame bought her boots when they were on sale.
She paid £17.50



SALE
**30% off!**

What was the **original price** of the boots?

show
your
method

£

2 marks

/6

**TOTAL**

# MISSION COMPLETE!



## How confident do you feel?

# INTERACTIVE GAME

Scan this QR code to access a Twinkl Go! Game to further practise your maths skills.

**SCAN ME**

# NOTES

# WORKING OUT

**1**    Here are three fractions.    $\dfrac{5}{20}$    $\dfrac{5}{8}$    $\dfrac{5}{40}$

Write the fractions in the correct place on the number line.

0                     $\dfrac{1}{2}$                     1

*1 mark*
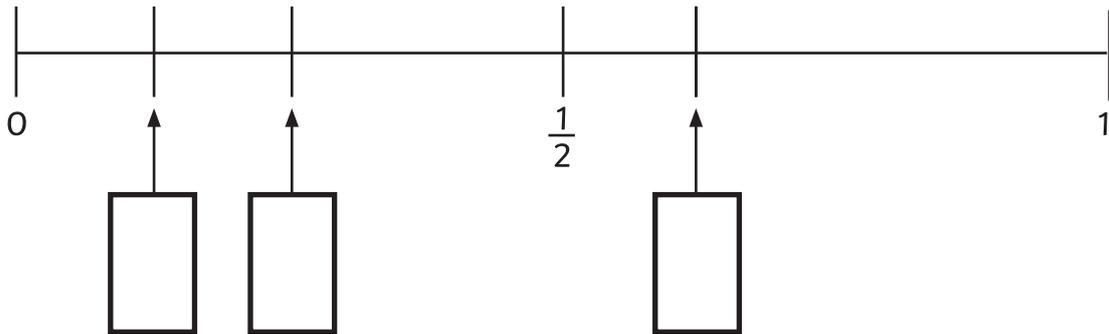
**2**    Priya writes, $\dfrac{1}{3} + \dfrac{4}{7} = \dfrac{5}{10} = \dfrac{1}{2}$    Elias writes, $\dfrac{1}{3} + \dfrac{4}{7} = \dfrac{19}{21}$

Who is correct? 

**Explain** the mistake that has been made.

*1 mark*

**3**    Write in the missing values to complete the calculation.

a)   $\dfrac{2}{3} \div \boxed{\phantom{0}} = \dfrac{1}{6}$

*1 mark*

b)   $\boxed{\phantom{0}} \div 3 = \dfrac{7}{60}$

*1 mark*

**4** This table shows Abi's test results for three different papers.

| Paper | Mark |
|---|---|
| Arithmetic | $\frac{72}{80}$ |
| Reasoning paper 1 | $\frac{12}{15}$ |
| Reasoning paper 2 | $\frac{14}{20}$ |
| Spelling | 80% |

a) In which subject did Abi get the **highest** mark?

b) In which **two** papers did she get the **same** mark?

**5** Felix asked some children to choose their favourite Study Squad superhero.

These were the results.

| Superhero | Number of children |
|---|---|
| The Fraction Flame | 11 |
| Captain Calculation | 12 |
| Doctor Digit | 17 |

What percentage of the children chose Captain Calculation?
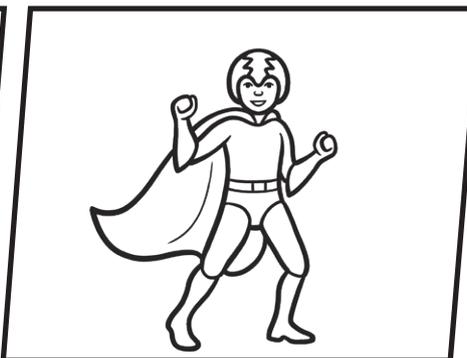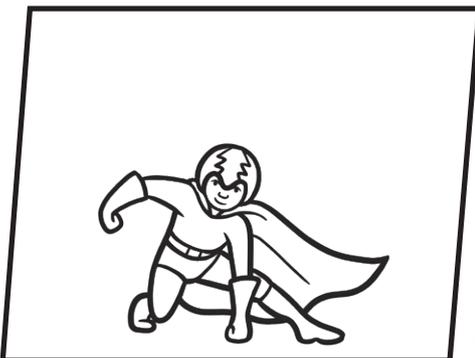
%

# MISSION COMPLETE!

### How confident do you feel?

# PROGRESS TRACKER

Write your scores from each concept in this unit to track your progress.

| | |
|---|---|
| Simplifying Fractions | **/9** |
| Converting between Mixed Numbers and Improper Fractions | **/7** |
| Equivalent Fractions | **/7** |
| Comparing and Ordering Fractions | **/7** |
| Adding and Subtracting Fractions | **/7** |
| Multiplying Fractions | **/7** |
| Dividing Fractions | **/7** |
| Fractions of Amounts | **/7** |
| Equivalent Fractions, Decimals and Percentages | **/7** |
| Using Percentages in Problems | **/6** |
| Fractions, Decimals and Percentages Mixed Practice | **/7** |
| **TOTAL** | **/78** |

# SELF-REFLECTION

What went well:

_____

_____

My target to improve:

_____

_____

It's time to recharge ready for the next unit with this mindfulness colouring page.

## SUPERCHARGE!

Use your knowledge of common factors to complete the multiplication grids.

| | a) | = 40 |
|---|---|---|
| 4 | | |
| b) | c) | = 96 |
| = 32 | = 120 | |

| d) | e) | = 56 |
|---|---|---|
| f) | g) | = 45 |
| = 60 | = 42 | |

## BOOST YOUR SUPERPOWERS

A ratio shows the relationship between two quantities. The total amount could increase or decrease but the parts remain proportional.

Here are six pieces of fruit.

The ratio of apples to bananas is 2:4

Like fractions, ratios can be simplified using a common factor. In this example, 2 and 4 have a common factor of 2 so the ratio can be simplified to 1:2

There are 36 pieces of fruit in a box.

The ratio of grapes to strawberries is 4:5

| 36 pieces of fruit | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| G | G | G | G | S | S | S | S | S |

There are **9** parts altogether.

Each part is worth **4**

**36 ÷ 9 = 4**

grapes: 4 × 4 = **16**

strawberries: 5 × 4 = **20**

REVISION VIDEO
SCAN ME

**1** In a zoo enclosure, there are 2 giraffes for every 3 zebras.
There are 18 giraffes.

How many animals are there in the enclosure altogether?

show your method

animals

2 marks

**2** Here are some shapes.

△△△□△△△□△△△□□

What is the ratio of triangles to squares?

☐ : ☐

1 mark

**3** The Ratio Rescuer helped two children to solve maths problems.

For every 9 questions he helped Drew to solve, he helped Abi to solve 5 questions.

Altogether, The Ratio Rescuer helped solve 42 questions.
How many questions did The Ratio Rescuer help Abi to solve?

show your method

questions

2 marks

**4** Jia was born in 2010.
Her younger brother was born in 2022.
They have the **same birthday.**

On their birthday in 2023, the ratio of Jia's age to her brother's age was 13:1

a) What will the ratio of their ages be on their birthday in **2025**?

   **Write it in its simplest form.**

   ☐ : ☐

b) In what year will their age ratio be 3:1?

show your method

# MISSION COMPLETE!

### How confident do you feel?

# NOTES

# WORKING OUT
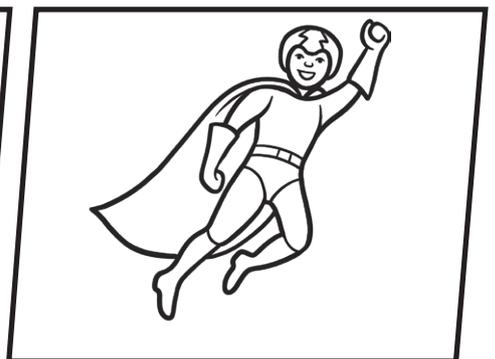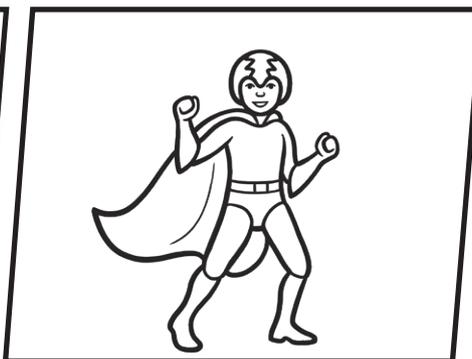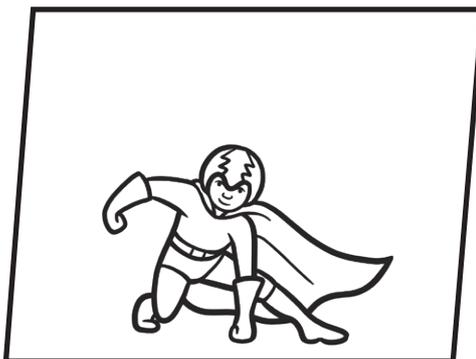
## SUPERCHARGE!

SCORE: [ /10 ]

For each question below, write either ×, ÷ or = in the **box** and a **whole number** on the **line** to make the calculations correct.

a) 5 [ ] ____ = 30

b) 48 [ ] ____ = 6

c) 63 = 9 [ ] ____

d) 4 [ ] ____cm equals 24cm

e) ____ [ ] 7 = 49

f) triple ____mm [ ] 45mm

g) 96 = 12 [ ] ____

h) double ____ [ ] 32

i) 81 [ ] ____ = 9

j) 7 = 42 [ ] ____

**Answers: a)** × 6   **b)** ÷ 8   **c)** × 7   **d)** × 6   **e)** 7 × or 343 ÷   **f)** 15 = g)) × 8   **h)** 16 =   **i)** ÷ 9   **j)** ÷ 6

## BOOST YOUR SUPERPOWERS

Scaling is when you **reduce** or **enlarge** dimensions **proportionally**. We use **multiplication** and **division** to calculate scale factors.

A **scale factor** is the number multiplied by all measurements of a shape to get the same shape in a different, **proportionate** size.
This means that the scale factor is the **ratio** between the measurements of the corresponding sides of a shape.

The length of shape A is **3** and the width is **2**
The length of shape B is **6** and the width is **4**
The dimensions of shape B are **2 times** (twice) as big as shape A.
Shape A has been enlarged by a **scale factor of 2** to make shape B.

REVISION VIDEO ▶ SCAN ME
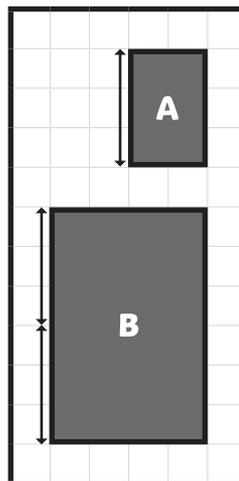
# MATHS MISSION

**1** The Ratio Rescuer's belt buckle has been enlarged by a **scale factor** of **2** in preparation for making a large sculpture of him.
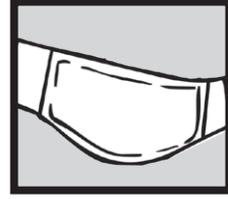
Draw the **enlarged belt** on the grid with a ruler.
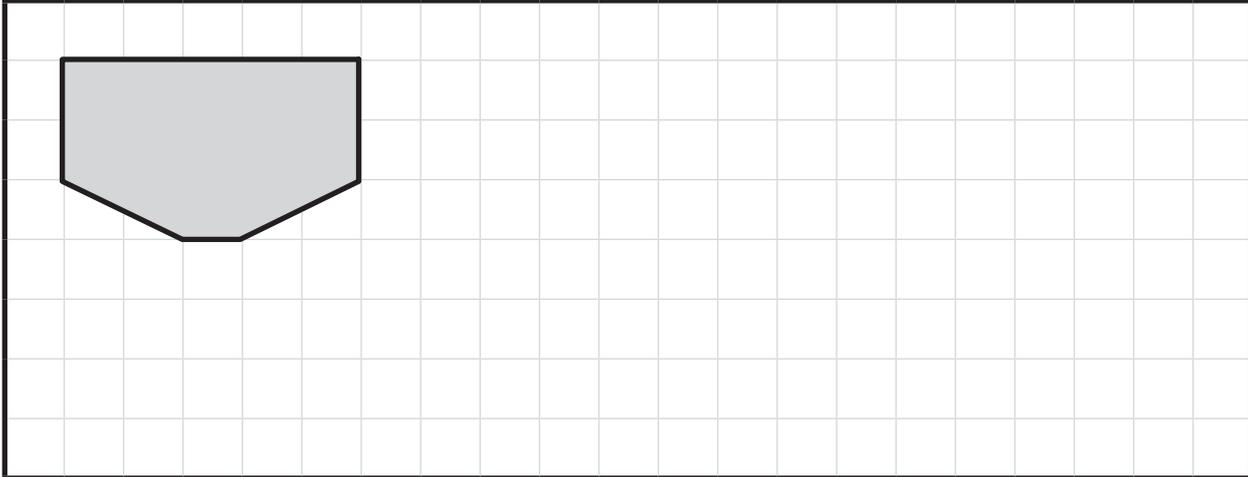
2 marks

**2** Elena has been practising enlarging shapes.
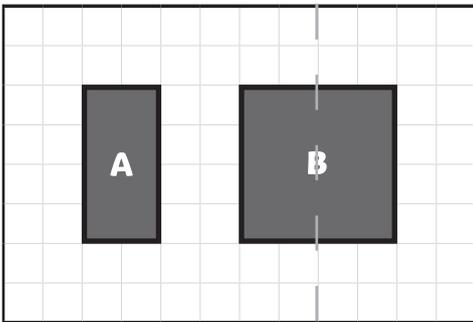
**ELENA**

Shape B is twice the size of shape A so this means that shape A has been enlarged by a scale factor of 2 to make shape B.

Is Elena correct? Circle Yes or No.
Explain your reasoning.

Yes / No

1 mark

This shape is the **result** of an enlargement by a scale factor of 3

6m

not to scale

9m

12m

15m

3m

21m
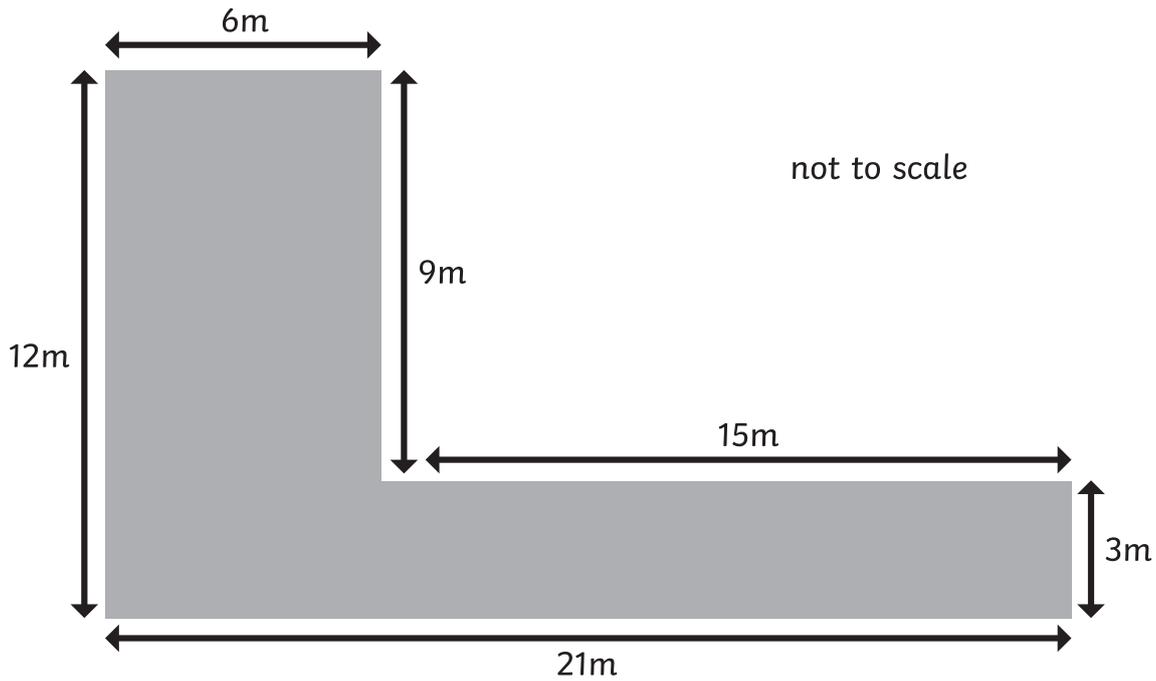
What is the perimeter of the original shape?

m

1 mark

/4

TOTAL

# MISSION COMPLETE!

### How confident do you feel?

# INTERACTIVE GAME

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**SCAN ME**

# NOTES

# WORKING OUT

## SUPERCHARGE!
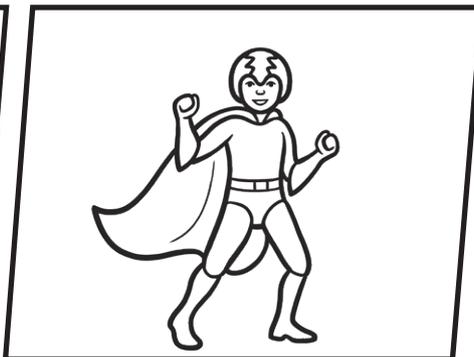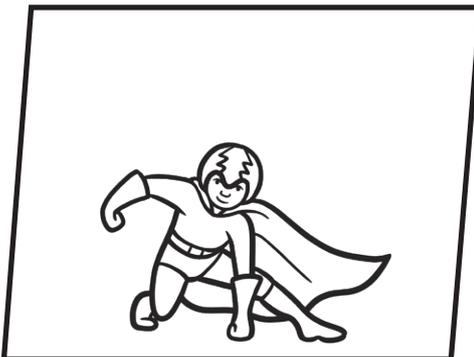
Look at the images of the Maths Heros in the box below.

Write the proportion of each superhero as a fraction in its simplest form. The first one has been done for you.

$= \dfrac{1}{5}$

a) $= \dfrac{\square}{\square}$

b) $= \dfrac{\square}{\square}$

c) $= \dfrac{\square}{\square}$

Answers: a) $\dfrac{1}{10}$ b) $\dfrac{2}{5}$ c) $\dfrac{3}{10}$

## BOOST YOUR SUPERPOWERS

Proportion tells us the relationship between a part and a whole.

■ ● ● ■ ●

In this example, the proportion of squares is 2 out of 5 and the proportion of circles is 3 out of 5

Double number lines can help us to solve proportion problems.

The cost of **3** rubbers is **£1.62**

How much do 5 rubbers cost?

First, we **divide by 3** to find the cost of **1 rubber.**

× 5

÷ 3

rubbers 0   1   2   3   4   5

cost 0   £0.54   £1.62   £2.70

÷ 3

× 5
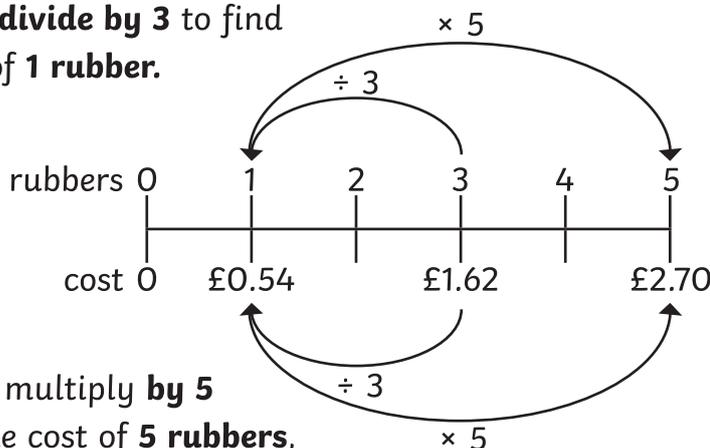
Then, we multiply **by 5** to find the cost of **5 rubbers**, which is **£2.70**

REVISION VIDEO ▶ SCAN ME

**1** The mass of a pencil is one-third of the mass of a pen.

If the **total** mass of **one pencil** and **one pen** is **60g**, what is the mass of the **pen**?

+ = 60g

| g |
|---|
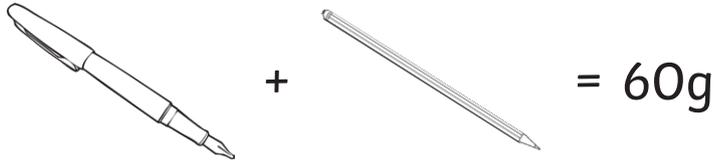
**2** Here is a recipe for scones.

240g self-raising flour

a pinch of salt

60g caster sugar

50g unsalted butter

1 egg

100ml buttermilk
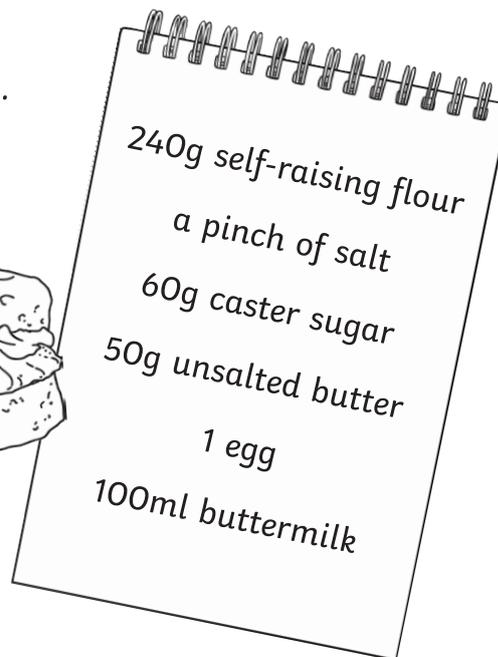
Drew makes the recipe using **2** eggs.
What mass of **unsalted butter** should they use?

| g |
|---|

Joseph makes the recipe using **40g** of **caster sugar**.
What mass of **self-raising flour** should he use?

| g |
|---|

**3** Hari says,

If I know the cost of 9 apples, I can work out the cost of 10 apples, as long as all apples cost the same.

HARI

Do you **Agree** or **Disagree** with Hari?

Agree / Disagree

**Explain** your answer.

1 mark

/4

**TOTAL**

## MISSION COMPLETE!

### How confident do you feel?

# INTERACTIVE GAME

Scan this QR code to access a Twinkl Go! Game to further practise your maths skills.

# NOTES

# WORKING OUT
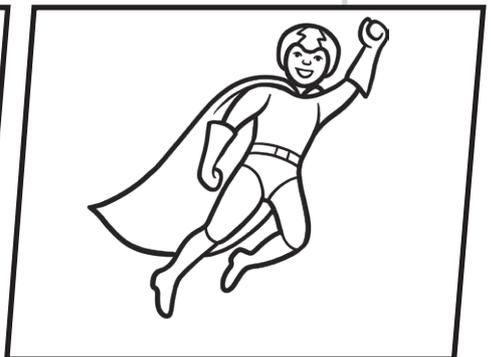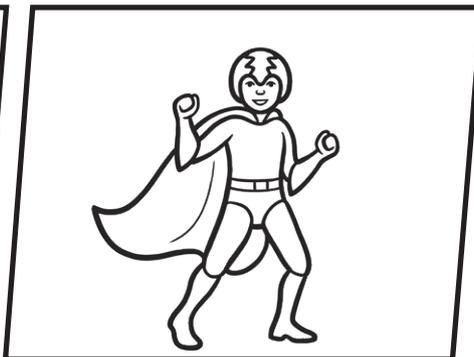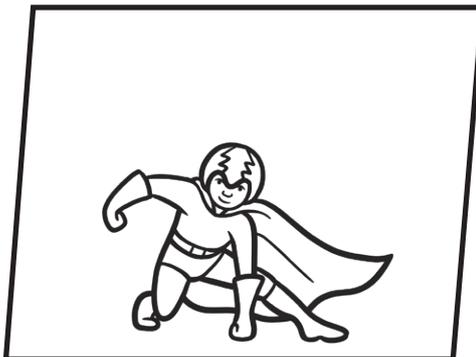
# SUBSTITUTING AND FORMULAS

## SUPERCHARGE!

SCORE: ☐ /4

Look at the function machines and answer the questions.

input → [ ] → **− 9** → output [ ]
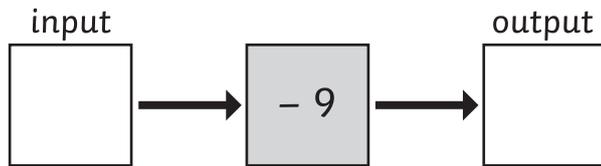
a) If the **input** is 45, what is the **output**? _____

b) If the **output** is 21, what is the **input**? _____

input → [ ] → **× 3** → output [ ]
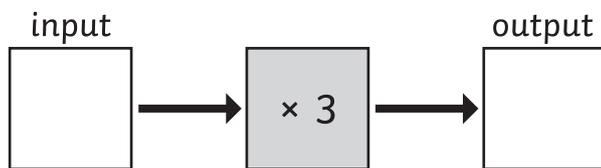
c) If the **input** is 7, what is the **output**? _____

d) If the **output** is 33, what is the **input**? ____

Answers: a) 36  b) 30  c) 21  d) 11

## BOOST YOUR SUPERPOWERS

In maths, the value of an unknown variable can be represented by an **algebraic letter**, e.g. $a$, $p$, $x$

We can use these unknown values in **expressions** to show that an operation has been performed on an unknown value, e.g. **2$x$**, which means $x \times 2$

A mathematical **formula** expresses the relationship between different **unknown values.**

When we **substitute** a number in the place of one of the unknown variables in the formula, we can find the value of the other variable.

☐ = $x$    ☐ = 1

**2$x$ + 3 = $y$**

If $x$ = 6
$y$ = (2 × 6) + 3
$y$ = **15**

REVISION VIDEO  SCAN ME

**1**

 = 7     = 11     = 2

a) △ + ● − ▭ = [　　　]

1 mark

b) ▭ × △ + ● = [　　　]
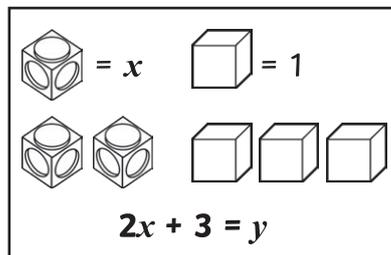
1 mark

**2**   $p = 32$

What is $3p + 7$? [　　　]

1 mark

**3**   Elena shares some sweets ($s$) between 4 of her friends. Which expression shows the number of sweets each of Elena's friends gets?

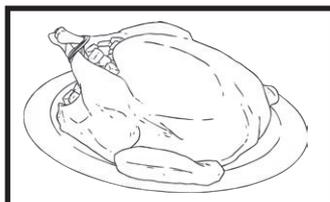Tick **one**.

☐ $4 \div s$     ☐ $s \div 4$

☐ $s - 4$     ☐ $4s$

1 mark

**4**   Here is a rule for the time it takes to cook a turkey.

**cooking time = 15 minutes plus an extra 40 minutes for each kilogram**

How many minutes would it take to cook a 4kg turkey?

[　　　] **minutes**

1 mark

**5** Circle one formula that shows the relationship between *c* and *d*.

| *c* | 1 | 2 | 3 | 4 |
|-----|---|----|----|----|
| *d* | 7 | 12 | 17 | 22 |

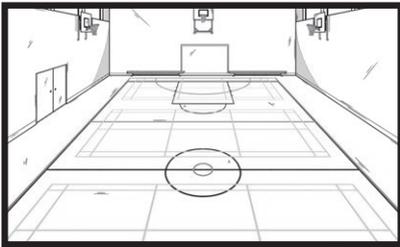$d = 5c + 2$           $d = 2c + 5$           $c = 5d + 2$

1 mark

**6** The Superhero Training College hires out the sports hall to local clubs.

They use this formula to work out the price of a club hiring out the sports hall.



**price = £3.50 booking fee + £7.50 per hour**

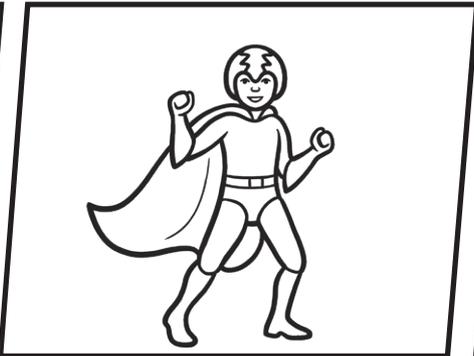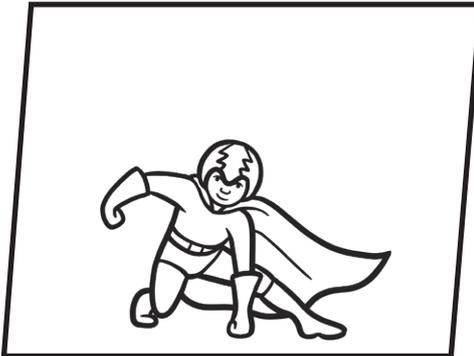What is the price for hiring out the sports hall from 9 a.m. until 12 p.m.?

£

1 mark

/7

**TOTAL**

# MISSION COMPLETE!



### How confident do you feel?

# INTERACTIVE GAME

Scan this QR code to access a Twinkl Go! Game to further practise your maths skills.

SCAN ME

# NOTES

# WORKING OUT

## SUPERCHARGE!

**SCORE:** ☐ /2

**What number am I?**

a) I start with a number.
   I multiply it by 4
   I add 9
   I divide it by 11
   I end with the number 3
   What number did I start with?

☐

b) I start with a number.
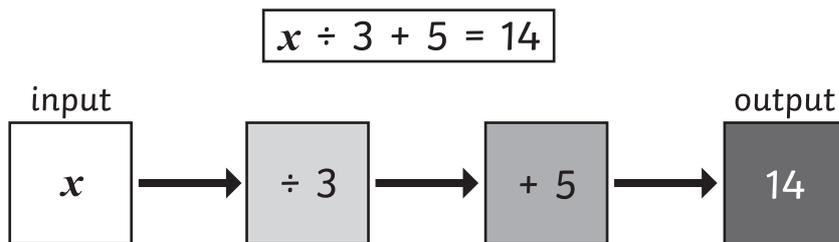   I subtract 19
   I divide it by 8
   I add 27
   I end with the number 36
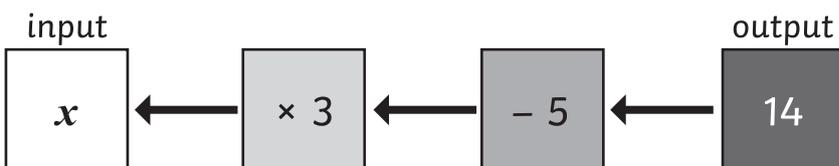   What number did I start with?

☐

**Answers: a) 6   b) 91**

## BOOST YOUR SUPERPOWERS

In algebra, we use letters to represent unknown values.

$$x \div 3 + 5 = 14$$

input

| $x$ | → | ÷ 3 | → | + 5 | → | output 14 |

We can **work backwards** and use the **inverse operations** to find the value of an algebraic letter in a **formula** or an **equation**.

input

| $x$ | ← | × 3 | ← | − 5 | ← | output 14 |

$$x = 27$$

REVISION VIDEO SCAN ME

REVISION VIDEO SCAN ME

**1**  $2s - 7 = 85$

Work out the value of $s$.

$s =$ [          ]

1 mark

**2**  The perimeter of this square is 34cm.

$l$
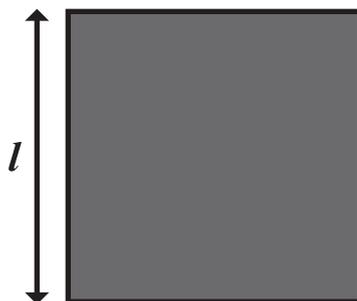
Work out the value of $l$.

$l =$ [          ] **cm**

1 mark

**3**  Bartek says,

| $5x = 325$ |
| $x + 38 = 103$ |

> **BARTEK**
>
> The value of the letter $x$ is the same in both of these equations.

Do you **Agree** or **Disagree** with Bartek?
**Explain** your answer.

Agree /Disagree

**4** $z$ is a whole number.

3$z$ is greater than 40

5$z$ is less than 90

Write **all** the numbers that $z$ could be.

**5** Doctor Digit spends **£15** on a new cape.

The cape shop uses this formula to work out the price for printing a cape with the new design.

**80p × number of digits + £5.40 = price**

Calculate how many digits Doctor Digit has on his cape.

show your method

digits

/7

**TOTAL**

# MISSION COMPLETE!

### How confident do you feel?

# NOTES

# WORKING OUT

## SUPERCHARGE!

SCORE: [ ] /11

$a + b = 10$          $a$ and $b$ are both positive, whole numbers.

Find **all** the possible pairs of combinations of the values $a$ and $b$.

| $a$ |  |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $b$ |  |  |  |  |  |  |  |  |  |  |  |

**Answers:** $a = 0$ and $b = 10$, $a = 1$ and $b = 9$, $a = 2$ and $b = 8$, $a = 3$ and $b = 7$, $a = 4$ and $b = 6$, $a = 5$ and $b = 5$, $a = 6$ and $b = 4$, $a = 7$ and $b = 3$, $a = 8$ and $b = 2$, $a = 9$ and $b = 1$, $a = 10$ and $b = 0$

## BOOST YOUR SUPERPOWERS

When we have to solve problems, where the values of two variables are unknown, we can use bar models. In both equations, $w$ is the same value and $p$ is the same value.

$4w + 3p = 305$

| $w$ | $w$ | $w$ | $w$ | $p$ | $p$ | $p$ |

$w + 3p = 155$

$\longleftarrow \quad 3w \quad \longrightarrow$ | $w$ | $p$ | $p$ | $p$ |

By representing the two equations as bar models, we can see that the value of $3w$ can be found by finding the difference between the two totals.

$$3w = 305 - 155 = 150$$
$$w = 150 \div 3$$
$$w = 50$$

When you have found the value of one unknown, substitute this into one of the equations to find the value of the second unknown. Here $p = 35$.

REVISION VIDEO — SCAN ME

REVISION VIDEO — SCAN ME

**1** $x + y = 200$

$x$ is a multiple of 5

$y$ is greater than 100 but less than 130

Find **all** the possible values of $x$ and $y$.

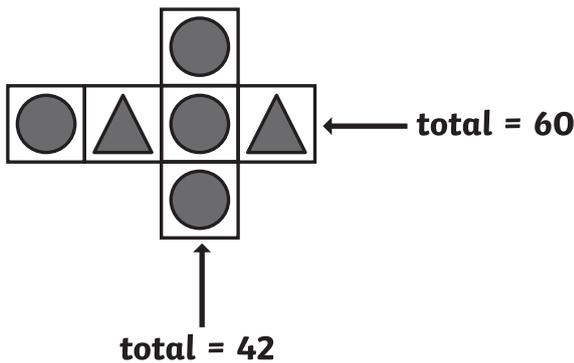| $x$ | | | | | |
|---|---|---|---|---|---|
| $y$ | | | | | |

2 marks

**2** Each shape represents a number.



**total = 60**

**total = 42**

Work out the **value** of each shape.

a) ⬤ = ☐

b) ▲ = ☐

2 marks

**3** Drew is making patterns with two different shapes.
They give each shape a value.



total value = 166

total value = 114
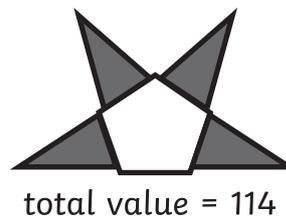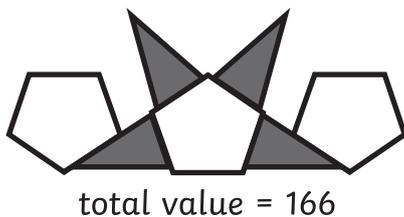
Calculate the value of each shape.

⬠ = ☐

▲ = ☐

2 marks

**4** *a* and *b* are **decimal** numbers.

$a + b = 8$

$a - b = 1$

What are the values of a and b?

*a* = ☐

*b* = ☐

2 marks

**5** These are the prices that two families pay to enter a theme park. All adult tickets are the same price and all child tickets are the same price.

**2 adult tickets + 2 child tickets = £13.00**

**2 adult tickets + 5 child tickets = £20.50**

$2a + 5c = £20.50$

| $a$ | $a$ | $c$ | $c$ | $c$ | $c$ | $c$ |

$2a + 2c = £13.00$

| $a$ | $a$ | $c$ | $c$ | |

a) How much does a child ticket cost? £ ☐

1 mark

b) How much does an adult ticket cost? £ ☐

1 mark

/10

**TOTAL**

# MISSION COMPLETE!

## How confident do you feel?

# INTERACTIVE GAME

Scan this QR code to access a Twinkl Go! Game to further practise your maths skills.

**SCAN ME**

# NOTES

# WORKING OUT

**1** Jia bought some bananas.
For every 4 bananas that Jia bought, 3 were ripe and ready to eat.
Altogether, 12 bananas were ripe and ready to eat.
How many bananas did Jia **buy**?

| bananas |
| --- |

1 mark

**2** A teacher uses this formula to calculate how much time their students are given to work through a maths quiz.
$m$ is the number of minutes given.
$q$ is the number of questions.

$$3q + 7 = m$$

a) How much time would students be given to answer a maths quiz with 16 questions?

| minutes |
| --- |

1 mark

b) The teacher wants their students to complete the quiz in a 40 minute lesson.

How many questions can they include in the quiz?

| questions |
| --- |

1 mark

c) The headteacher asks the teacher to prepare a quiz that takes less than 20 minutes for the students to complete.

Find all the possible values of $m$ and $q$ where $m$ is the whole number of minutes given.

| $m$ | | | | |
| --- | --- | --- | --- | --- |
| $q$ | | | | |

2 marks

**3** A shop sells pasta at 80p for 500g.
How much would it cost for 1.25kg of pasta?

£ 

*1 mark*

**4** Look at this shape.
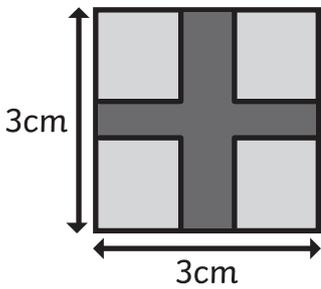
3cm

2cm
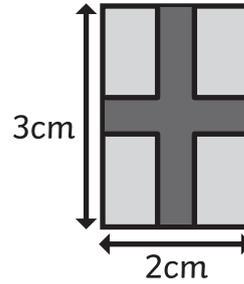
Circle the image that has been enlarged by a scale factor of 1.5
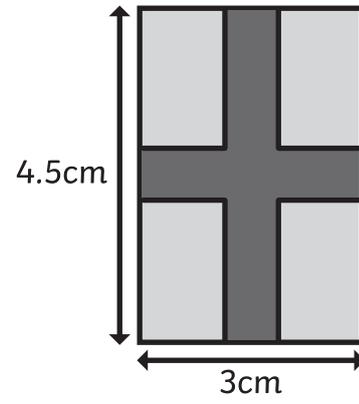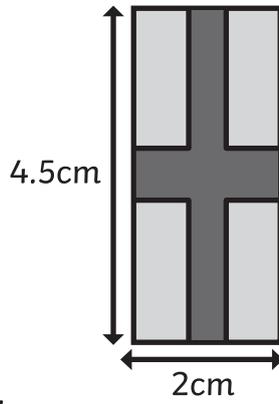
3cm

3cm

4.5cm

2cm

4.5cm

3cm

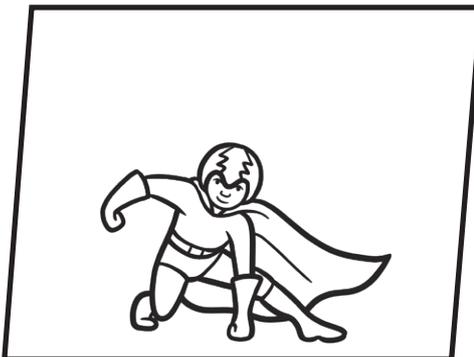**Explain** your answer.

*1 mark*

/7

**TOTAL**

# MISSION COMPLETE!



## How confident do you feel?

# PROGRESS TRACKER

Write your scores from each step in this unit to track your progress.

| | |
|---|---|
| Ratio | / 8 |
| Scale Factors | / 4 |
| Proportion | / 4 |
| Substituting and Formulas | / 7 |
| Solving Equations | / 7 |
| Solving Problems with Two Unknowns | / 10 |
| Ratio, Proportion and Algebra Mixed Practice | / 7 |
| **TOTAL** | / 47 |

Great work!

# SELF-REFLECTION

What went well:

_____

_____

My target to improve:

_____

_____

Complete the grids so that each row, column and smaller rectangle contains each of the digits from 1 to 6 once.

**Grid 1**

|   |   |   |   |   |   |
|---|---|---|---|---|---|
|   | 2 |   | 3 | 6 |   |
|   |   |   | 5 |   | 2 |
| 1 | 5 |   |   |   | 4 |
| 2 |   | 3 | 1 | 5 | 6 |
| 4 | 3 |   | 6 | 1 |   |
| 6 | 1 |   | 4 | 2 |   |

**Grid 2**

|   |   |   |   |   |   |
|---|---|---|---|---|---|
|   | 5 |   |   | 4 | 3 |
| 6 |   |   |   | 1 | 5 |
|   |   | 6 |   | 3 |   |
|   |   | 3 |   | 6 |   |
| 4 | 6 | 5 | 3 |   | 1 |
| 3 |   |   | 4 | 5 |   |

**Grid 3**

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| 6 | 3 | 2 | 4 |   |   |
| 4 |   | 1 | 6 | 3 |   |
|   | 6 | 3 | 1 |   |   |
| 1 |   | 5 |   | 6 |   |
| 5 |   |   | 3 |   | 4 |
|   |   |   |   |   | 6 |

**Grid 4**

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| 5 | 2 | 4 |   | 3 |   |
|   |   |   | 5 |   | 2 |
|   | 4 |   | 6 | 1 | 5 |
| 6 | 5 | 1 |   | 2 |   |
|   |   |   | 2 | 5 | 3 |
| 2 |   |   | 4 | 6 | 1 |

**Grid 5**

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| 1 | 3 | 2 |   |   | 4 |
| 4 | 5 | 6 |   | 3 | 2 |
|   |   |   |   | 1 |   |
| 5 | 4 | 1 | 6 |   |   |
| 2 |   | 5 | 3 |   | 1 |
| 3 | 1 | 4 | 2 |   |   |

**Grid 6**

|   |   |   |   |   |   |
|---|---|---|---|---|---|
|   | 6 |   | 5 |   |   |
|   | 4 | 3 |   | 2 |   |
|   |   |   |   | 5 |   |
| 6 |   |   |   |   | 4 |
|   |   |   |   |   | 1 |
|   | 3 |   | 4 |   | 5 |

# ROMAN NUMERALS

| | | | |
|---|---|---|---|
| I | 1 | XXX | 30 |
| II | 2 | XL | 40 |
| III | 3 | L | 50 |
| IV | 4 | LX | 60 |
| V | 5 | LXX | 70 |
| VI | 6 | LXXX | 80 |
| VII | 7 | XC | 90 |
| VIII | 8 | C | 100 |
| IX | 9 | D | 500 |
| X | 10 | M | 1000 |
| XX | 20 | MD | 1500 |

**Remember:**

When a Roman numeral with a smaller value comes **after** a Roman numeral with an equal or greater value, they are **added** together.

When a Roman numeral with a smaller value comes **before** a Roman numeral with a greater value, it is **subtracted** from the value of the greater number.

# PLACE VALUE CHART

The column on the far left of the chart has the **greatest** value and the values gradually decrease the further right you gois the **greatest** value which gradually decreases the further right you go. After the **decimal** point, the value is **less than** one whole.

You can use equipment such as counters to help you **represent** different numbers. You can also use a pencil and a rubber to write numbers.

| | | | | |
|---|---|---|---|---|
| millionths | m | | | |
| hundred thousandths | hth | | | |
| ten thousandths | tth | | | |
| thousandths | th | | | |
| hundredths | h | | | |
| tenths | t | | | |
| Ones | • O | • | • | • |
| Tens | T | | | |
| Hundreds | H | | | |
| Thousands | Th | | | |
| Ten Thousands | TTh | | | |
| Hundred Thousands | HTh | | | |
| Millions | M | | | |

# TIMES TABLES CHART

| ✗ | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|----|----|----|
| 1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 2 | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 |
| 3 | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 | 30 | 33 | 36 |
| 4 | 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 | 44 | 48 |
| 5 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 |
| 6 | 6 | 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 | 60 | 66 | 72 |
| 7 | 7 | 14 | 21 | 28 | 35 | 42 | 49 | 56 | 63 | 70 | 77 | 84 |
| 8 | 8 | 16 | 24 | 32 | 40 | 48 | 56 | 64 | 72 | 80 | 88 | 96 |
| 9 | 9 | 18 | 27 | 36 | 45 | 54 | 63 | 72 | 81 | 90 | 99 | 108 |
| 10 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 |
| 11 | 11 | 22 | 33 | 44 | 55 | 66 | 77 | 88 | 99 | 110 | 121 | 132 |
| 12 | 12 | 24 | 36 | 48 | 60 | 72 | 84 | 96 | 108 | 120 | 132 | 144 |

# PRIME NUMBERS TO 100

A number greater than 1 with no divisors other than 1 and itself.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|-----|
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

**Remember:**

There are no **even** numbers except 2

There are no prime numbers ending in **5**, except 5

The digits can't **add** up to 3 except 3 (digital root).

# FACTORS AND MULTIPLES

## Factors

Find the different factors of a number by working out which numbers divide into it evenly.

| What are all the factors of |
| :---: |
| **12?** |

$$12 ÷ 1 = 12$$

$$12 ÷ 2 = 6$$
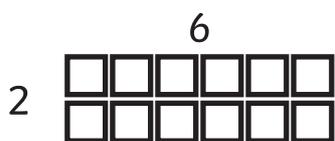
$$12 ÷ 3 = 4$$
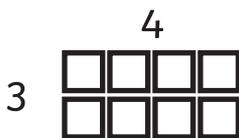
| The factors of 12 are: |
| :---: |
| **1, 2, 3, 4, 6, 12** |

**Remember:**
A factor is a number that, when multiplied with another, produces a given number.

## Multiples

Multiples appear in the number's multiplication table. You can calculate them by counting on in steps of that number

| What are all the multiples of |
| :---: |
| **12?** |

$$12 × 1 = 12$$

$$12 × 2 = 24$$
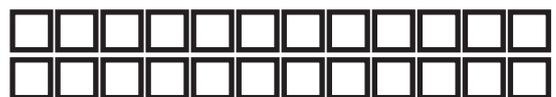
$$12 × 3 = 36$$
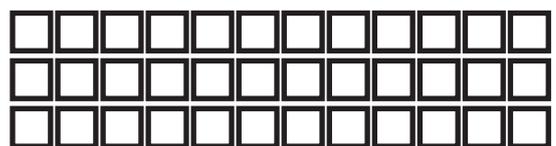
$$12 × 4 = 48$$
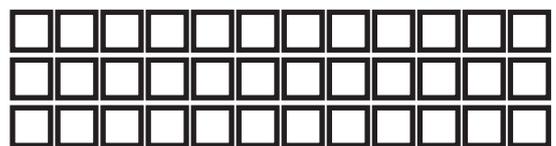
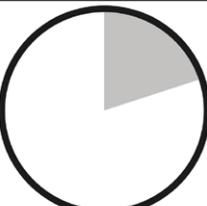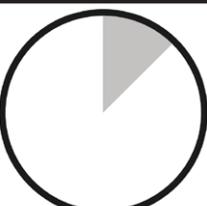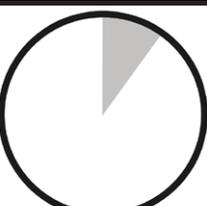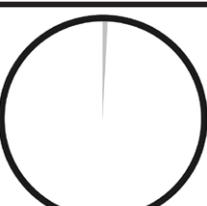| The multiples of 12 are: |
| :---: |
| **12, 24, 36, 48...** |

**Remember:**
A multiple is a number that may be divided by another, a certain number of times, without a remainder.

# FRACTIONS, DECIMALS AND EQUIVALENTS
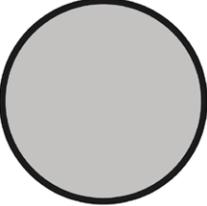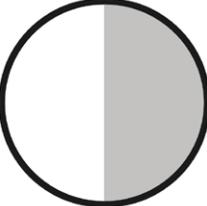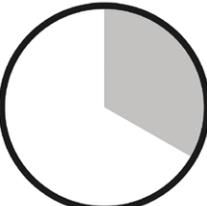
| | | | | | |
|---|---|---|---|---|---|
| ⬤ | = 1 | = | 1 | = | 100% |
| ◐ | = $\frac{1}{2}$ | = | 0.5 | = | 50% |
| ◔ | = $\frac{1}{3}$ | = | 0.33 | = | 33.3% |
| ◔ | = $\frac{1}{4}$ | = | 0.25 | = | 25% |
| ◔ | = $\frac{1}{5}$ | = | 0.2 | = | 20% |
| ◔ | = $\frac{1}{8}$ | = | 0.125 | = | 12.5% |
| ◔ | = $\frac{1}{10}$ | = | 0.1 | = | 10% |
| ◯ | = $\frac{1}{100}$ | = | 0.01 | = | 1% |
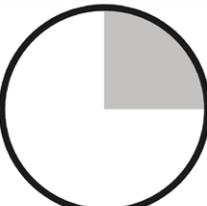
# SQUARE AND CUBE NUMBERS

| Square Numbers | |
|:---:|:---:|
| $1^2$ | $1 \times 1 = 1$ |
| $2^2$ | $2 \times 2 = 4$ |
| $3^2$ | $3 \times 3 = 9$ |
| $4^2$ | $4 \times 4 = 16$ |
| $5^2$ | $5 \times 5 = 25$ |
| $6^2$ | $6 \times 6 = 36$ |
| $7^2$ | $7 \times 7 = 49$ |
| $8^2$ | $8 \times 8 = 64$ |
| $9^2$ | $9 \times 9 = 81$ |
| $10^2$ | $10 \times 10 = 100$ |
| $11^2$ | $11 \times 11 = 121$ |
| $12^2$ | $12 \times 12 = 144$ |
| $13^2$ | $13 \times 13 = 169$ |
| $14^2$ | $14 \times 14 = 196$ |
| $15^2$ | $15 \times 15 = 225$ |

| Cube Numbers | |
|:---:|:---:|
| $1^3$ | $1 \times 1 \times 1 = 1$ |
| $2^3$ | $2 \times 2 \times 2 = 8$ |
| $3^3$ | $3 \times 3 \times 3 = 27$ |
| $4^3$ | $4 \times 4 \times 4 = 64$ |
| $5^3$ | $5 \times 5 \times 5 = 125$ |
| $6^3$ | $6 \times 6 \times 6 = 216$ |
| $7^3$ | $7 \times 7 \times 7 = 343$ |
| $8^3$ | $8 \times 8 \times 8 = 512$ |
| $9^3$ | $9 \times 9 \times 9 = 729$ |
| $10^3$ | $10 \times 10 \times 10 = 1000$ |
| $11^3$ | $11 \times 11 \times 11 = 1331$ |
| $12^3$ | $12 \times 12 \times 12 = 1728$ |
| $13^3$ | $13 \times 13 \times 13 = 2197$ |
| $14^3$ | $14 \times 14 \times 14 = 2744$ |
| $15^3$ | $15 \times 15 \times 15 = 3375$ |