Mathematics test

Paper 1
Calculator **not** allowed

Please read this page, but do not open your booklet until your teacher tells you to start. Write your name and the name of your school in the spaces below. If you have been given a pupil number, write that also.

First name _____

Last name _____

School _____

Pupil number

Remember

- The test is 1 hour long.
- You **must not** use a calculator for any question in this test.
- You will need: pen, pencil, rubber and a ruler.
- Some formulae you might need are on page 2.
- This test starts with easier questions.
- Try to answer all the questions.
- Write all your answers and working on the test paper – do not use any rough paper.
- Check your work carefully.
- Ask your teacher if you are not sure what to do.

For marker's use only

Total marks

Instructions

Answers

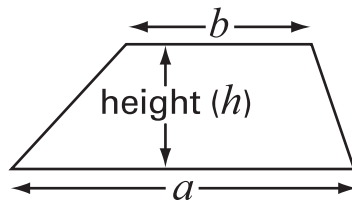This means write down your answer or show your working and write down your answer.

Calculators

You **must not** use a calculator to answer any question in this test.
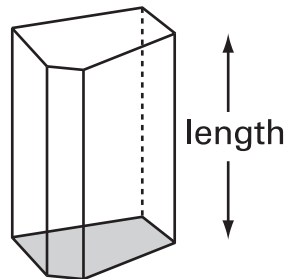
Formulae
You might need to use these formulae

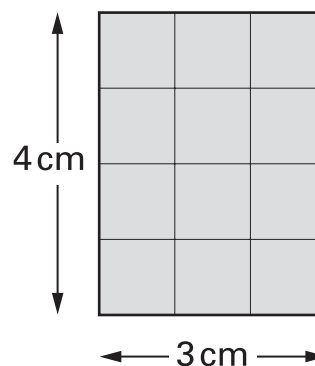### Trapezium

b

height (h)

a

Area $= \frac{1}{2}(a + b)h$

Prism

length

Volume = area of cross-section × length

2

1. (a) What is the **area** of this rectangle?

.... cm^2

4 cm

3 cm
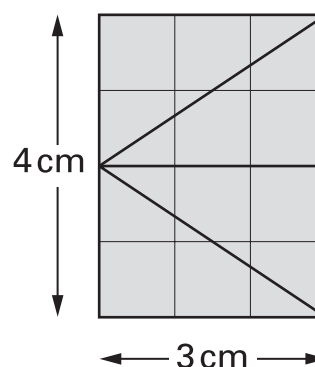
1 mark

(b) I use the rectangle to make four triangles.
Each triangle is the same size.

What is the area of **one** of the triangles?

4 cm

3 cm

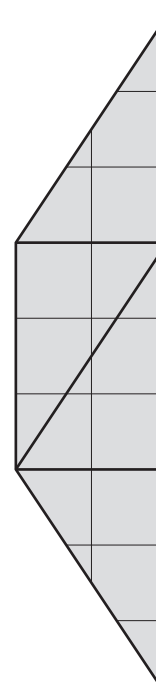.......... cm^2

1 mark

(c) I use the four triangles to make a trapezium.

What is the area of the trapezium?

.... cm^2

1 mark

2.   Use **+**, **−**, **✕** or **÷** to make each calculation correct.

Examples:

2 ...**+**... 4 = 7 ...**−**... 1

5 ...**✕**... 3 = 3 ...**✕**... 5

5 .... 2 = 10 3

12 .... 3 = 3 3

2 .... 1 = 9 3

6 .... 6 = 7 7

3. Two pupils drew angles on square grids.
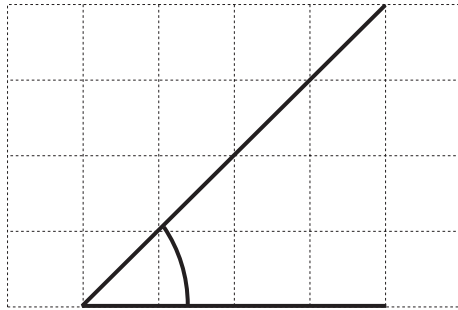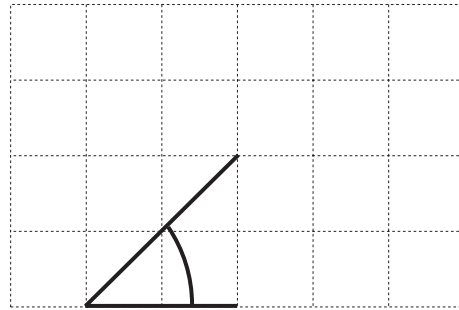
Angle **A**   Angle **B**

(a) Which word below describes angle **A**?

Tick (✓) the correct box.

acute ☐

obtuse ☐

right-angled ☐

reflex ☐

1 mark

(b) Is angle **A bigger** than angle **B**?

Tick (✓) Yes or No.

Yes ☐   No ☐

Explain your answer.

1 mark

4. There are **four** different ways to put 6 pupils into equal size groups.

6 pupils

1 group of 6

2 groups of 3

3 groups of 2

6 groups of 1
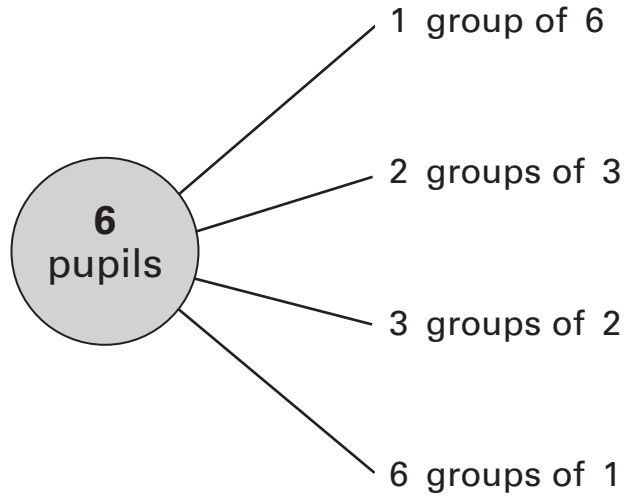
(a) Show the **five** different ways to put 16 pupils into equal size groups.

16 pupils

.... group of ....

.... groups of ....

.... groups of ....

.... groups of ....

.... groups of ....
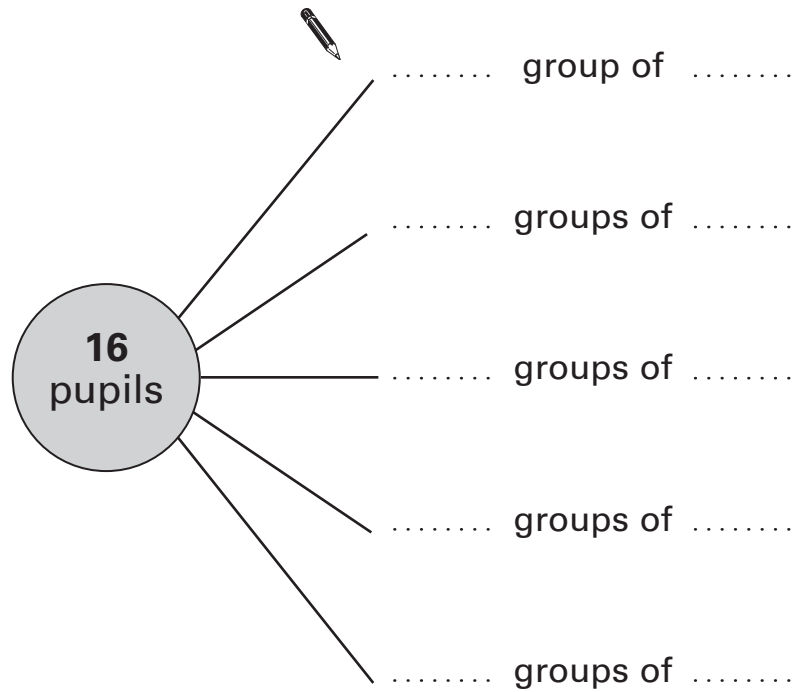
2 marks

(b) Circle the numbers below that are **factors of twelve**.

1   2   3   4   5   6

7   8   9   10   11   12

2 marks

5. (a) I can think of three different rules to change **6** to **18**

6 ⟶ 18

Complete these sentences to show what these rules could be.

first rule: **add** . . . .

1 mark

second rule: **multiply by** . . . .

1 mark

third rule: **multiply by 2 then** . . . .

1 mark

(b) Now I think of a new rule.

The new rule changes **10** to **5** **and** it changes **8** to **4**

10 ⟶ 5   8 ⟶ 4

Write what the new rule could be.

. . . .

1 mark

6.

P **Car Park**
Car Park Charges
15p for **8 minutes**

How much does it cost to park for **40 minutes**?

Show your working.

p

2 marks

7. (a) Peter's height is **0.9 m**.

Lucy is **0.3 m taller** than Peter.

What is Lucy's height?

✎ [m]

1 mark

(b) Lee's height is **1.45 m**.

Misha is **0.3 m shorter** than Lee.

What is Misha's height?
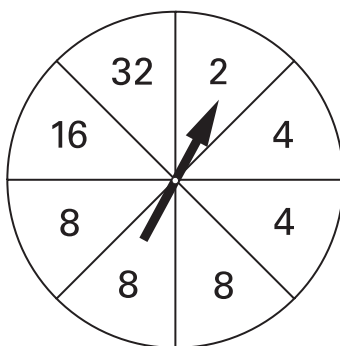
✎ [m]

1 mark

(c) Zita's height is **1.7 m**.

What is Zita's height in **centimetres**?

✎ [cm]

1 mark

9

8. (a) A spinner has **eight** equal sections.

What is the probability of scoring **4** on the spinner?

What is the probability of scoring an **even** number on the spinner?

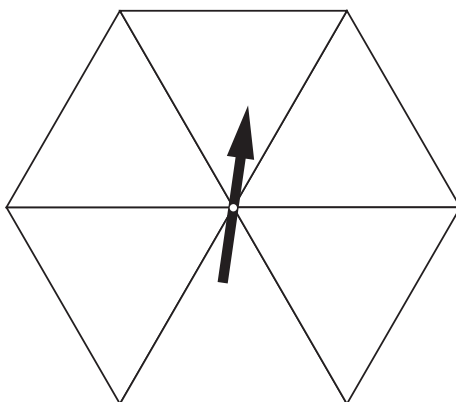(b) A different spinner has six equal sections and **six numbers**.

On this spinner, the probability of scoring an **even** number is $\frac{2}{3}$

The probability of scoring **4** is $\frac{1}{3}$

Write what numbers could be on this spinner.

9.   Look at this table.

	Age (in years)
Ann	a
Ben	b
Cindy	c

Write in words the meaning of each equation below.

The first one is done for you.

$b = 30$	Ben is 30 years old
$a + b = 69$	
$b = 2c$	
$\dfrac{a + b + c}{3} = 28$	

1 mark

1 mark

1 mark

10. **Four** squares join
together to make a bigger square.
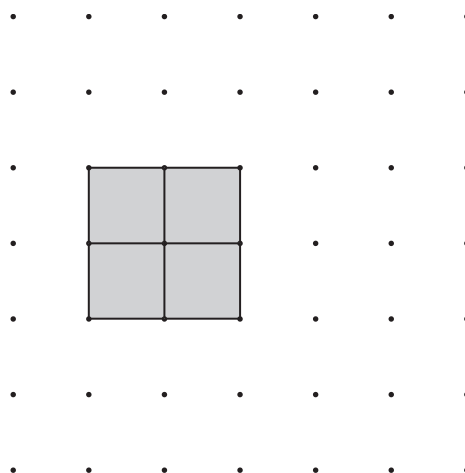
(a) **Four** congruent triangles join
together to make a bigger triangle.

Draw **two more** triangles to complete
the drawing of the bigger triangle.
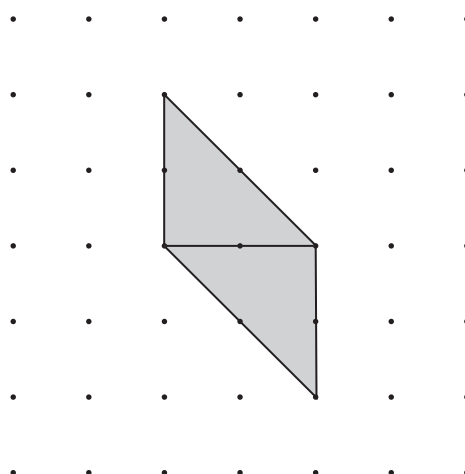
1 mark

(b) Four congruent trapeziums join to make a bigger trapezium.

Draw **two more** trapeziums to complete the drawing of the
bigger trapezium.

1 mark

 12

(c) Four congruent trapeziums join together to make a **parallelogram**.
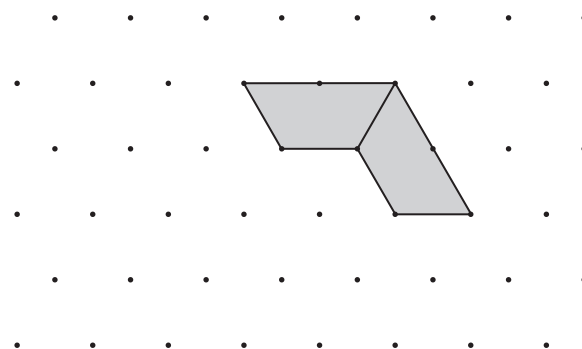
Draw **two more** trapeziums to complete the drawing of the parallelogram.
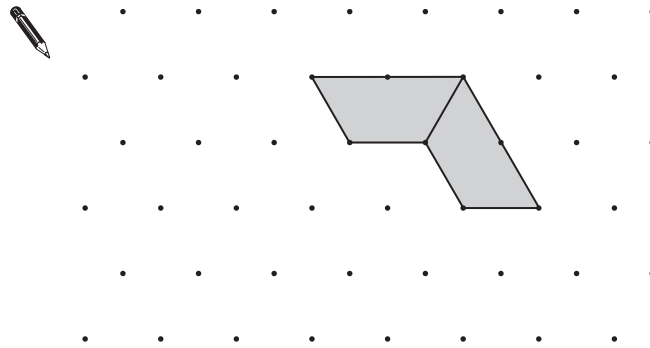
1 mark

11. (a) The number 6 is halfway between 4.5 and 7.5

6

↓

4.5 _____ 7.5
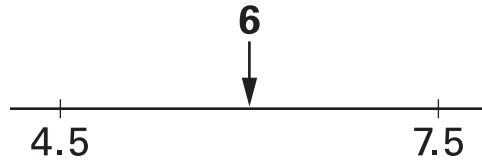
Fill in the missing numbers below.

The number 6 is halfway between   **2.8**   and . . . .

1 mark

The number 6 is halfway between   **–12**   and . . . .

1 mark

(b) Work out the number that is halfway between   **27 × 38**   and   **33 × 38**
Show your working.

. . . .

2 marks

12. Hakan asked 30 pupils which subject they liked best.

Subject	Number of boys	Number of girls
Maths	4	7
English	2	4
Science	3	3
History	0	1
French	1	5
	total 10	**total 20**

(a) Which subject did **20%** of **boys** choose?

. . . .

1 mark

(b) Which subject did **35%** of **girls** choose?

. . . .

1 mark

(c) Hakan said:

'In my survey, **Science** was equally popular
with boys and girls'.

Explain why Hakan was **wrong**.

1 mark

(d) Which subject **was** equally popular with boys and girls?

. . . .

1 mark

13. This advert was in a newspaper.
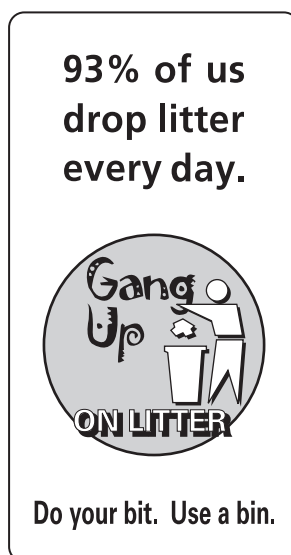
It does not say how the advertisers know that 93% of people drop litter every day.

Some pupils think the percentage of people who drop litter every day is much lower than 93%.

They decide to do a survey.

(a) Jack says:

> We can ask 10 people if they drop litter every day.

Give two **different** reasons why Jack's method might not give very good data.

First reason:

1 mark

Second reason:

1 mark

(b) Lisa says:

> We can go into town on Saturday morning.
>
> We can stand outside a shop and record how many people walk past and how many of those drop litter.

Give two **different** reasons why Lisa's method might not give very good data.

First reason:

1 mark

Second reason:

1 mark

14. Fill in the missing numbers in the boxes using **only negative numbers**.

$$\boxed{} - \boxed{} = 5$$

1 mark

$$\boxed{} - \boxed{} = -5$$

1 mark

15. (a) When **x = 5**, work out the values of the expressions below.

$2x + 13 = \ldots\ldots\ldots$

$5x - 5 = \ldots\ldots\ldots$

$3 + 6x = \ldots\ldots\ldots$

<div align="right">2 marks</div>

(b) When $2y + 11 = 17$, work out the value of y

Show your working.

$y = \ldots\ldots\ldots$

<div align="right">2 marks</div>

(c) Solve the equation $9y + 3 = 5y + 13$

Show your working.

$y = \ldots\ldots\ldots$

<div align="right">2 marks</div>

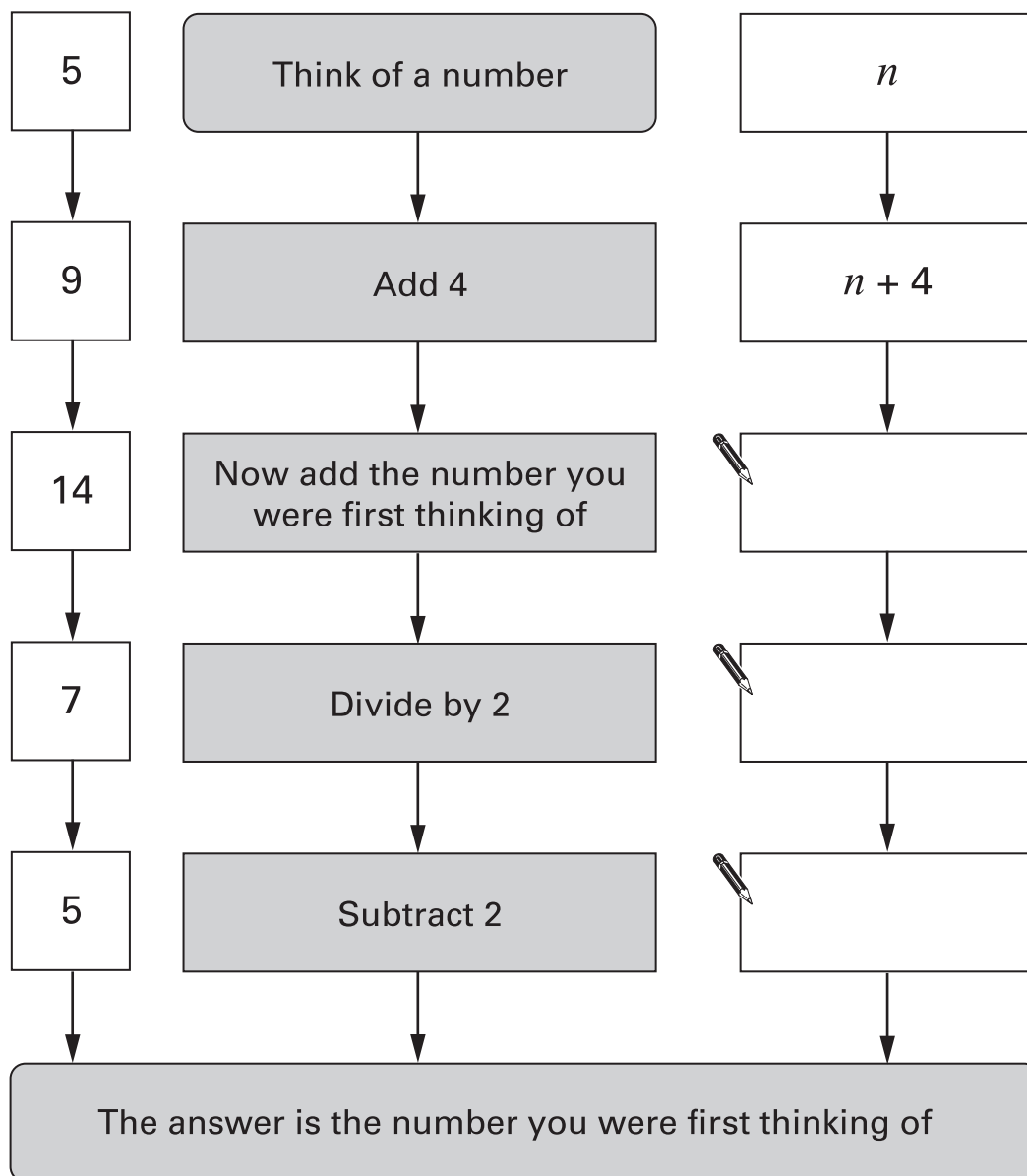**16.**   You can often use algebra to show why a number puzzle works.

Fill in the missing expressions.

Example: Algebra:

| 5 | Think of a number | n |

| 9 | Add 4 | $n + 4$ |

| 14 | Now add the number you were first thinking of | |

| 7 | Divide by 2 | |

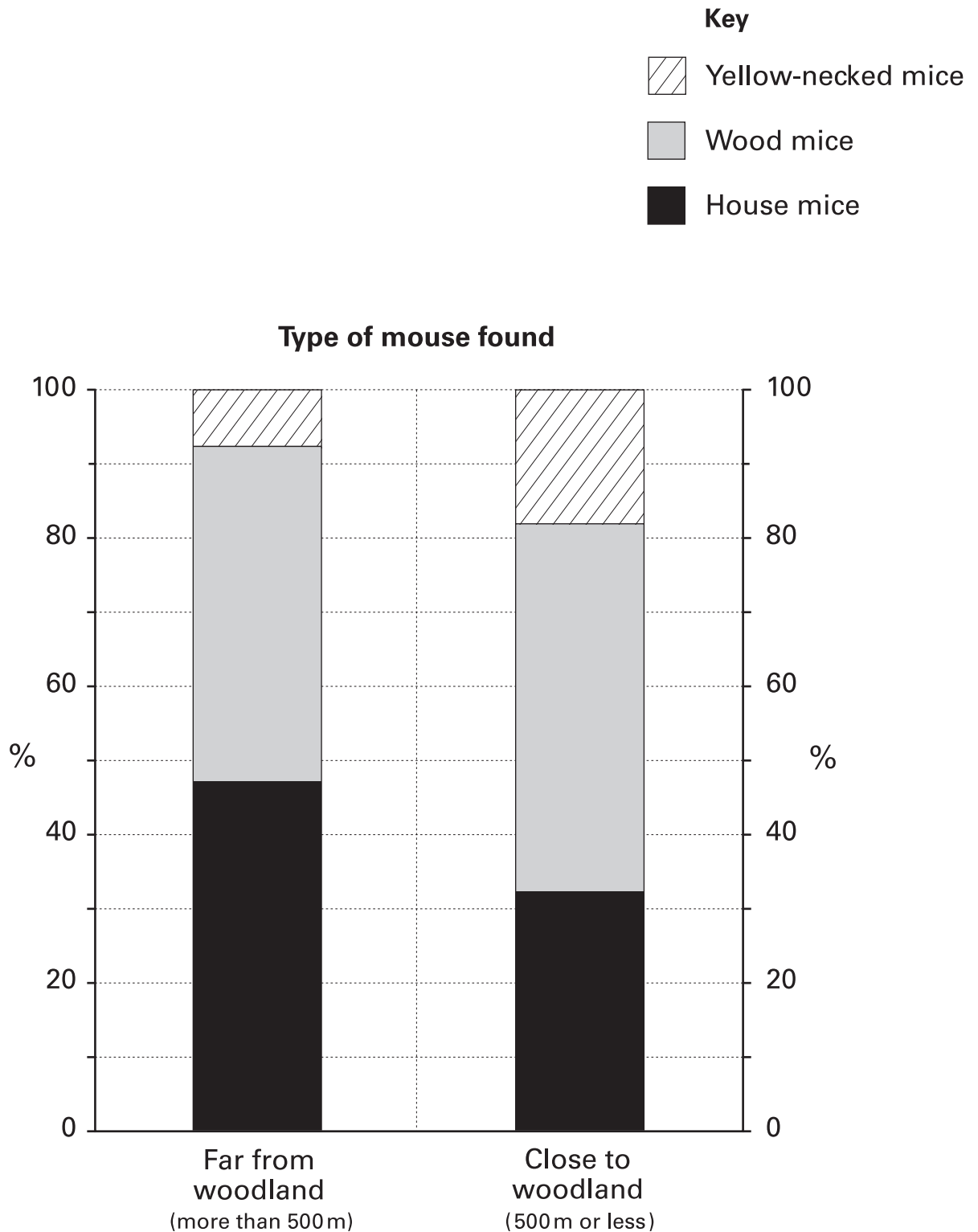| 5 | Subtract 2 | |

| The answer is the number you were first thinking of |

2 marks

17. Three types of mice might come into our homes.

Some mice are more likely to be found in homes far from woodland. Others are more likely to be found in homes close to woodland.

The bar charts show the **percentages of mice** that are of each type.

Key

◨ Yellow-necked mice

▨ Wood mice

■ House mice

Type of mouse found

Far from
woodland
(more than 500 m)

Close to
woodland
(500 m or less)

Use the bar charts to answer these questions.

(a) About what percentage of mice in homes **close to woodland** are **wood mice**?

.... %

(b) About what percentage of mice in homes **far from woodland** are **not** wood mice?

.... %

(c) The **black** bars show the percentages for house mice.
One of the black bars is taller than the other.

Does that mean there **must be more** house mice in homes far from woodland than in homes close to woodland?
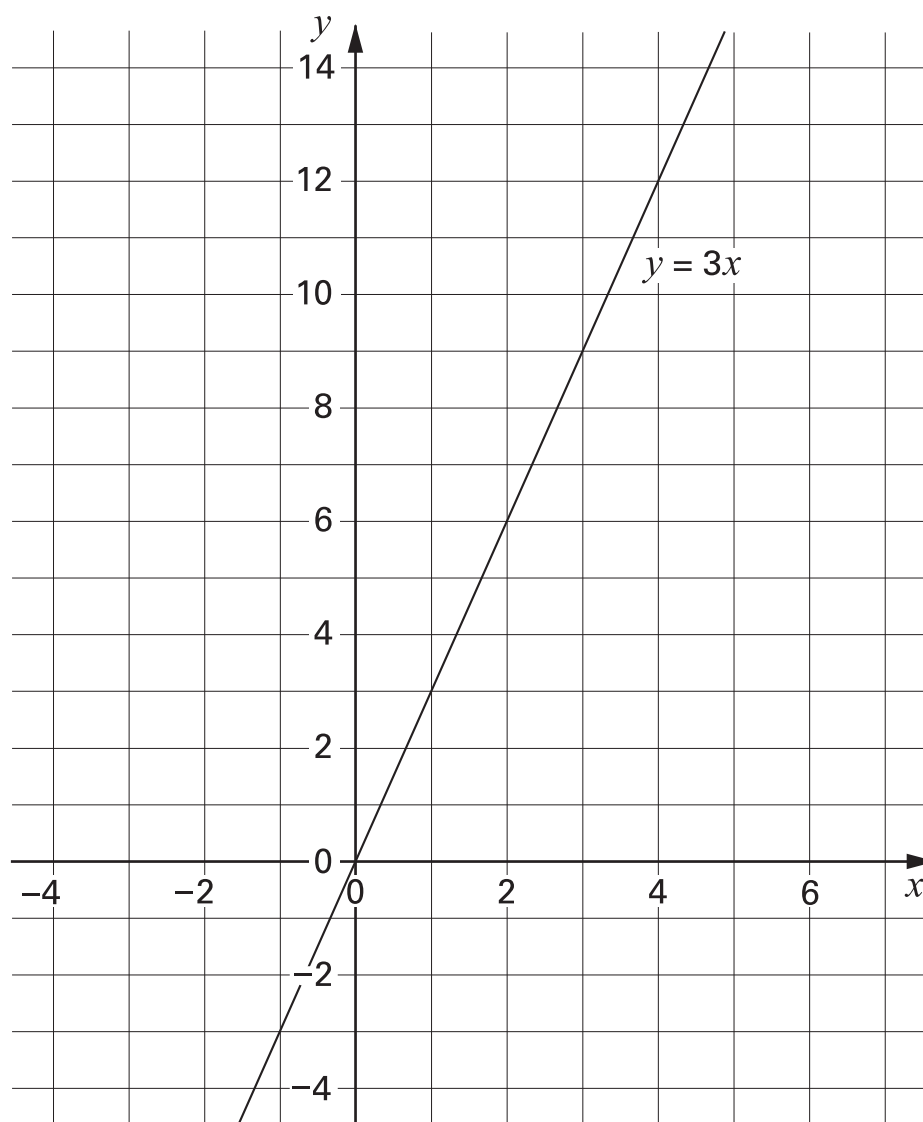
Tick (✓) Yes or No.

Yes ☐   No ☐

Explain your answer.

18. The graph shows a straight line. The equation of the line is $\textbf{\textit{y}} = \textbf{3}\textit{x}$

Does the point (25, 75) lie on the straight line $y = 3x$?

Tick (✓) Yes or No.

✏️   Yes ☐   No ☐

Explain how you know.

✏️

1 mark

19. $\frac{1}{3}, \frac{1}{8}, \frac{1}{5}$ are all examples of unit fractions.

All unit fractions must have

a numerator that is 1

$\frac{1}{3}$

a denominator that is an integer greater than 1
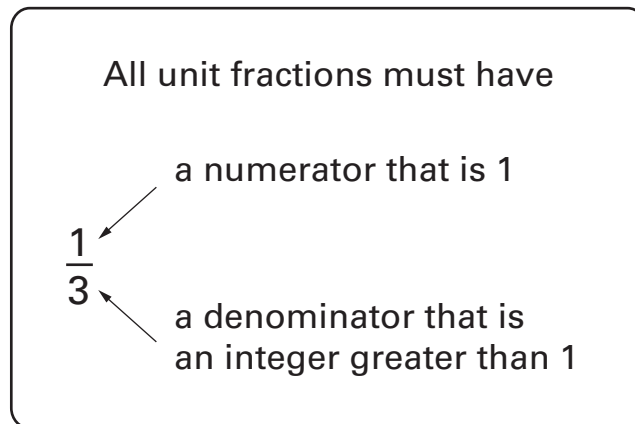
The ancient Egyptians used only unit fractions.

For $\frac{3}{4}$, they wrote the sum $\frac{1}{2} + \frac{1}{4}$

(a) For what fraction did they write the sum $\frac{1}{2} + \frac{1}{5}$?

Show your working.

....

1 mark

(b) They wrote $\frac{9}{20}$ as the sum of two unit fractions.

One of them was $\frac{1}{4}$

What was the other?

Show your working.

1 mark

....

1 mark

END OF TEST