Instructions

Answers

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

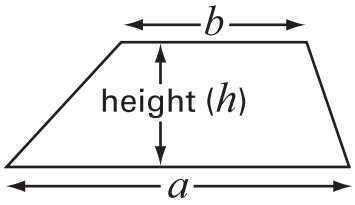
Calculators

You **may** use a calculator in this test.

Formulae

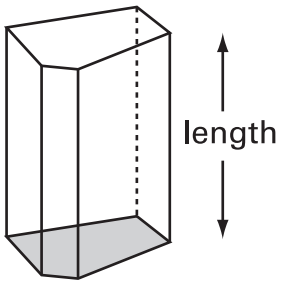
You might need to use these formulae.

Trapezium



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

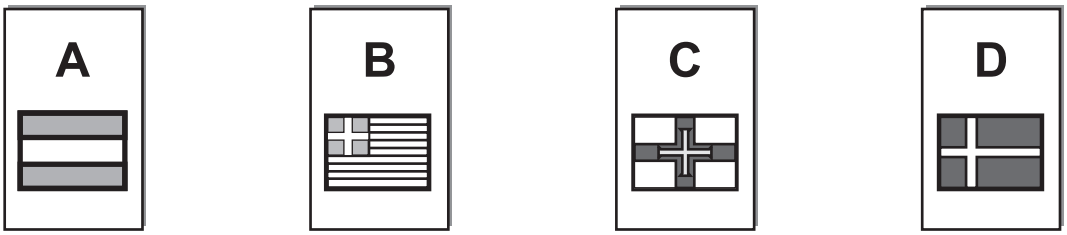
Prism



Volume = area of cross-section × length

1. In each box of cereal there is a free gift of a card.
You cannot tell which card will be in a box. Each card is equally likely.

There are **four** different cards: A, B, C or D



(a) **Zoe** needs card **A**
Her brother **Paul** needs cards **C** and **D**

They buy one box of cereal.

What is the probability that the card is one that **Zoe** needs?

. . . . . .
1 mark

What is the probability that the card is one that **Paul** needs?

. . . . . .
1 mark

(b) Then their mother opens the box.
She tells them the card is **not card A**

Now what is the probability the card is one that **Zoe** needs?

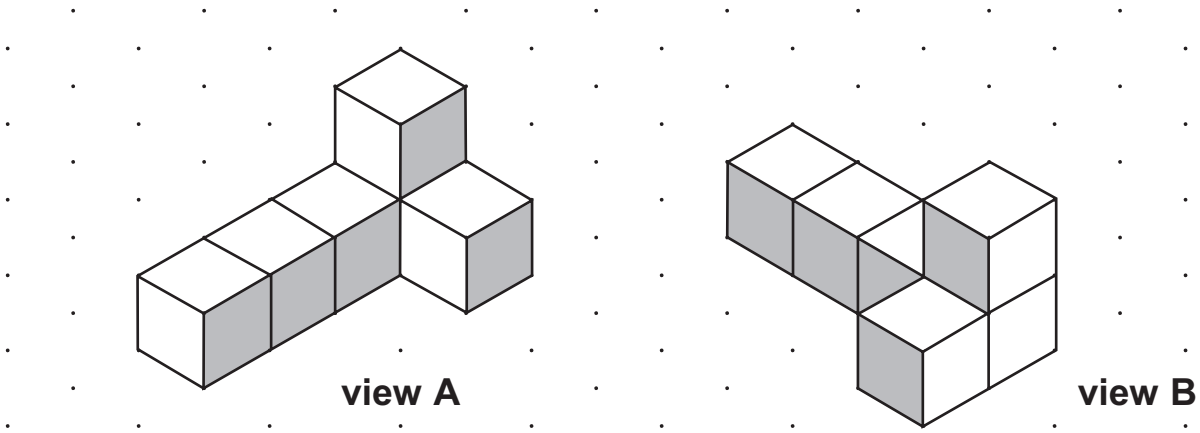
. . . . . .
1 mark

What is the probability that the card is one that **Paul** needs?

. . . . . .
1 mark

2. I make a model with 6 cubes.

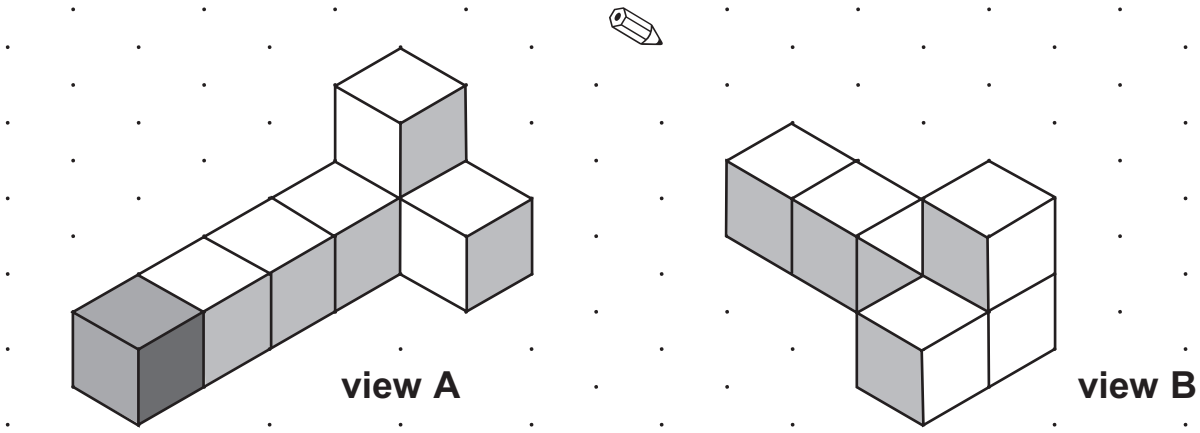
The drawings show my model from **different views**.



(a) I join one more cube to my model.

The drawing from **view A** shows where I join the cube.

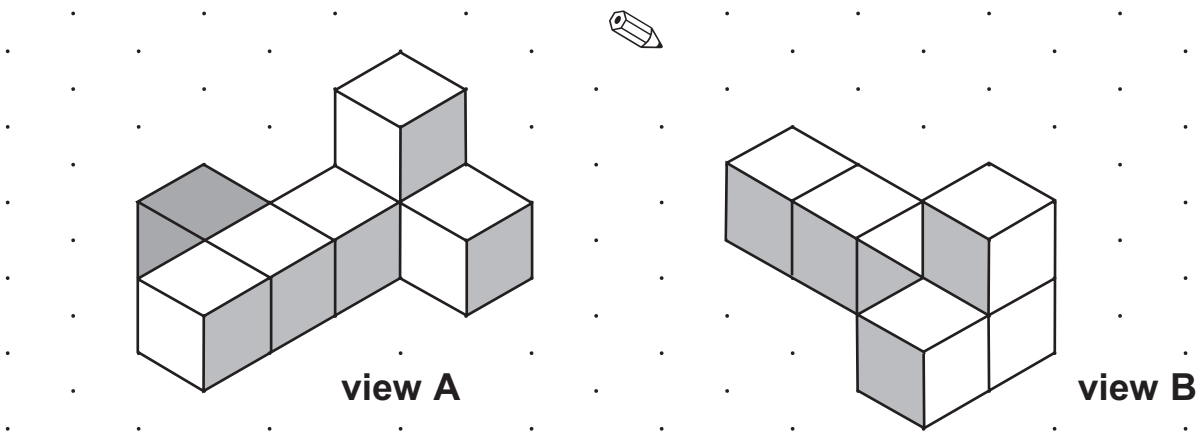
Complete the drawing from **view B**



1 mark

(b) Then I move the cube to a different position.

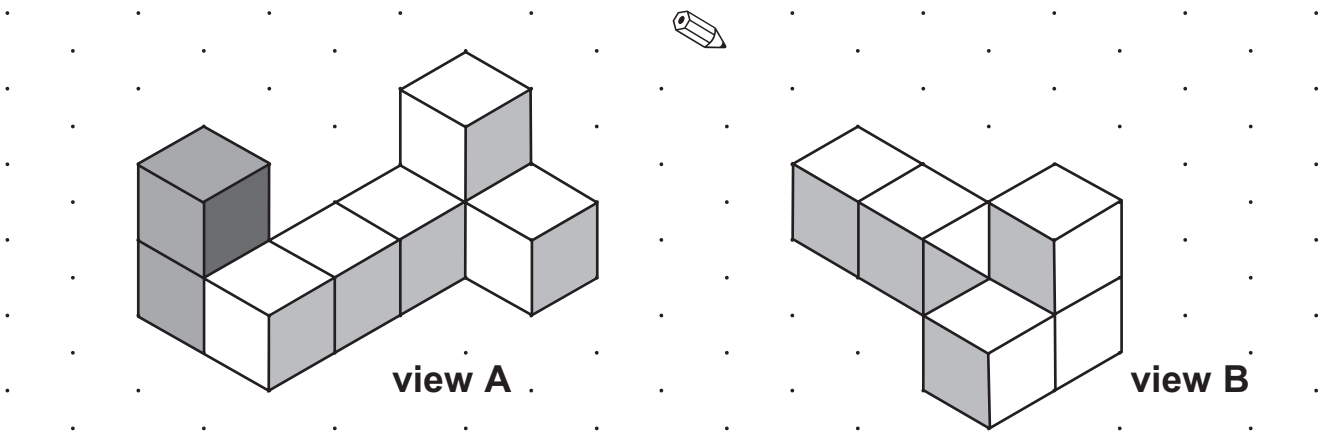
Complete the drawing from **view B**



1 mark

(c) I add two cubes to make a different shape.

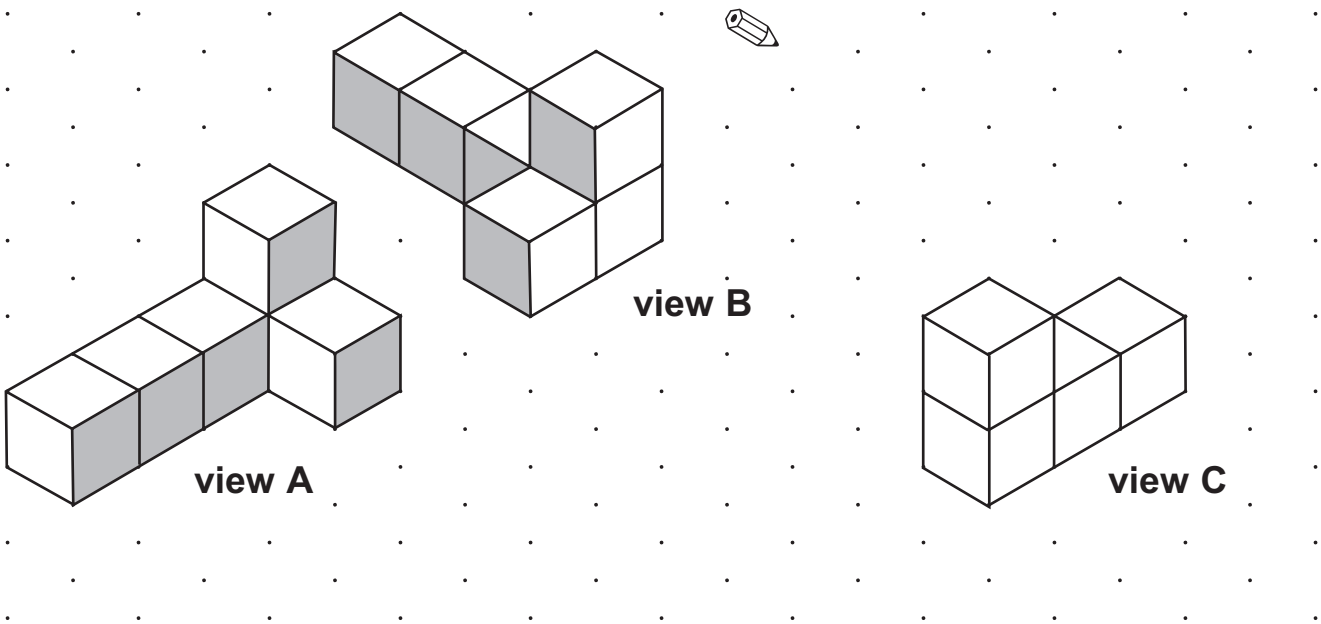
Complete the drawing from **view B**



1 mark

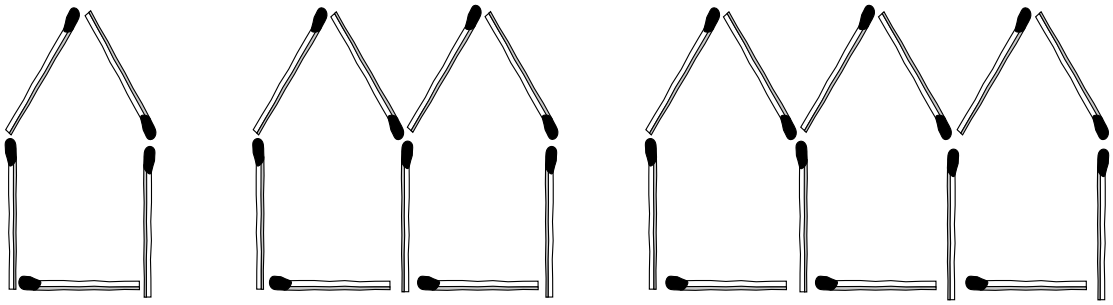
(d) I start again with my original model of 6 cubes.
The drawing shows it from **view A** and from **view B**
I start to draw it from a different view.

Complete the drawing from **view C**



1 mark

3. You can make 'huts' with matches.



1 hut needs 5 matches

2 huts need 9 matches

3 huts need 13 matches

A rule to find how many matches you need is

$$m = 4h + 1$$

m stands for the number of matches.

h stands for the number of huts.

(a) **Use the rule** to find how many matches you need to make **8** huts.

Show your working.

. . . .

. . . . . matches . . . .

2 marks

(b) I use **81 matches** to make some huts.

How many huts do I make?

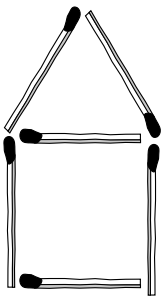
Show your working.

. . . .

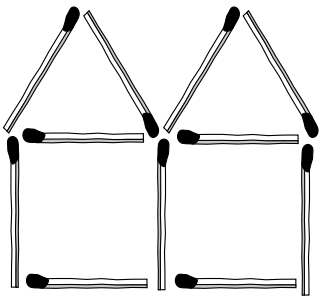
. . . . . huts . . . .

2 marks

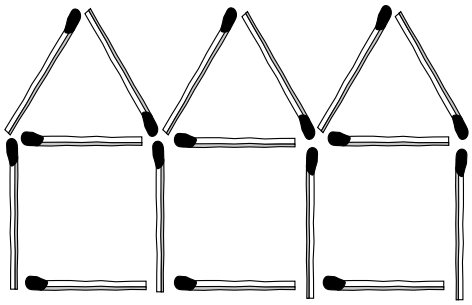
(c) Andy makes different ‘huts’ with matches.



1 hut needs
6 matches



2 huts need
11 matches



3 huts need
16 matches

Circle the rule below that shows how many matches he needs.

Remember: m stands for the number of matches.

h stands for the number of huts.

$m = h + 5$ $m = 4h + 2$ $m = 4h + 3$

$m = 5h + 1$ $m = 5h + 2$ $m = h + 13$

1 mark

4. A school has a new canteen.

A special person will be chosen to perform the opening ceremony.

The names of all the pupils, all the teachers and all the canteen staff are put into a box.

One name is taken out at random.

A pupil says:

> There are only three choices.
> It could be a pupil, a teacher or one of the canteen staff.
> The probability of it being a **pupil** is $\frac{1}{3}$

The pupil is **wrong**. Explain why.

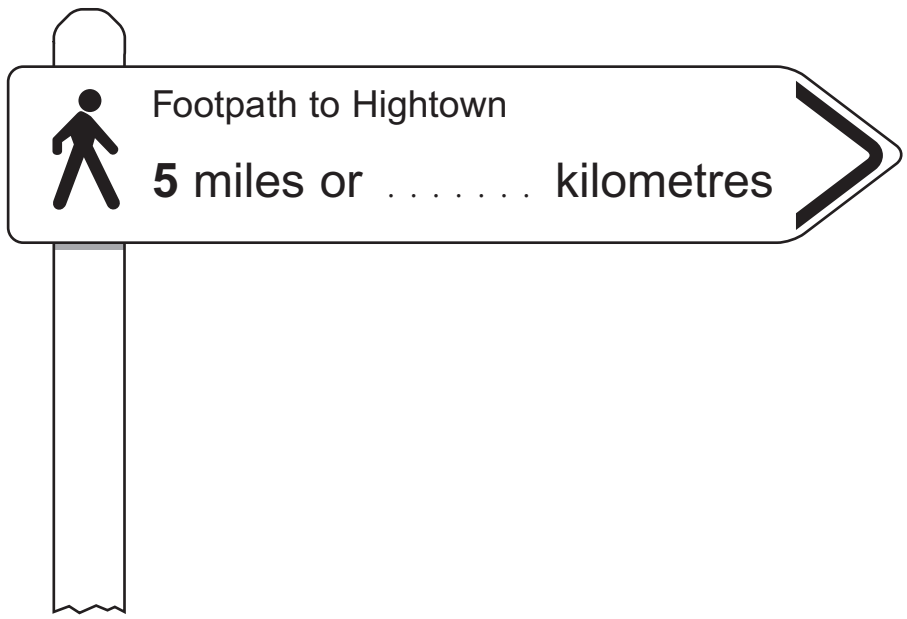
. . . .
1 mark

5. Calculate

8% of £26.50 = £ . . . .
1 mark

$12\frac{1}{2}$% of £98 = £ . . . .
1 mark

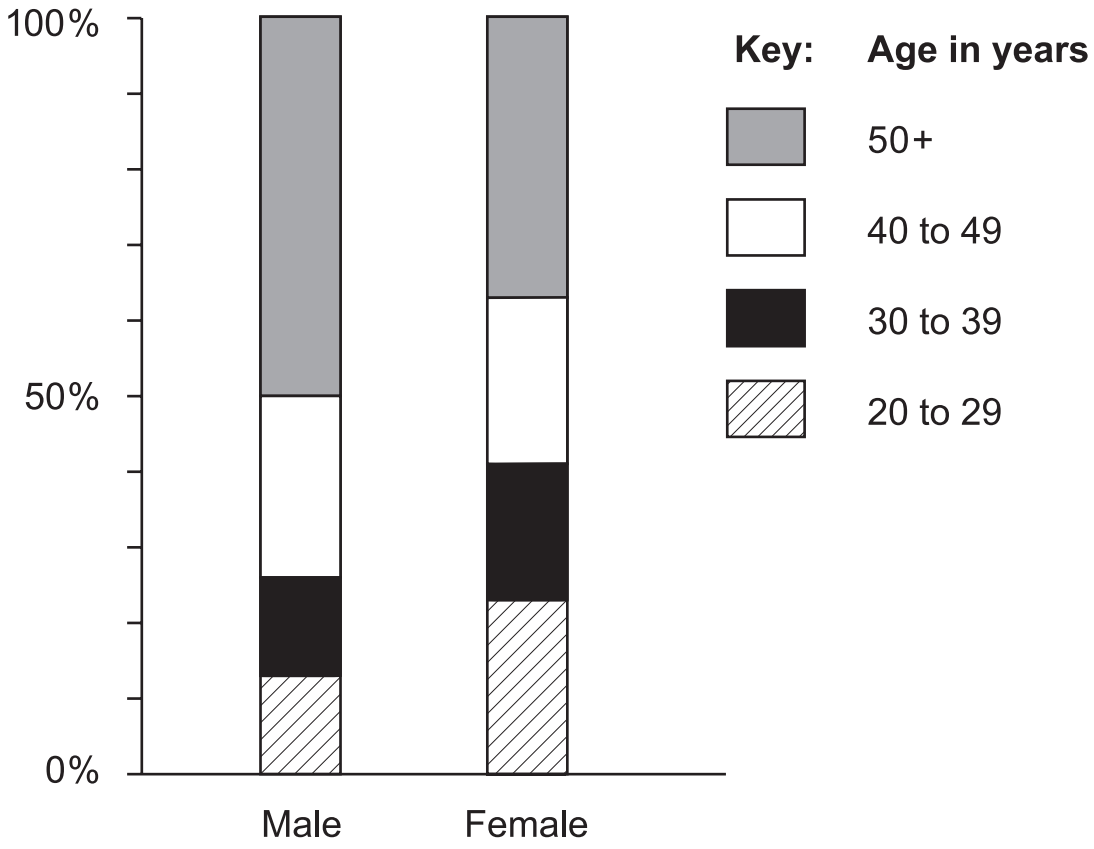
6. How many kilometres are there in **5 miles**?
Complete the missing part of the sign.



. . . .
1 mark

7. A newspaper predicts what the ages of secondary school teachers will be in six years' time.

They print this chart.



(a) The chart shows **24%** of male teachers will be aged 40 to 49

About what percentage of female teachers will be aged 40 to 49?

. . . . . %

. . . .
1 mark

(b) About what percentage of **female** teachers will be aged **50+**?

. . . . . %

. . . .
1 mark

Graphic: Laura Sylvester/TES

(c) The newspaper predicts there will be about
20 000 male teachers aged 40 to 49

Estimate the number of male teachers that will be aged 50+

. . . . . .

. . . .
1 mark

(d) Assume the total number of male teachers will be about the same as the total number of female teachers.

Use the chart to decide which statement is correct.

Tick (✓) your answer.

Generally, male teachers will tend to be younger than female teachers. ☐

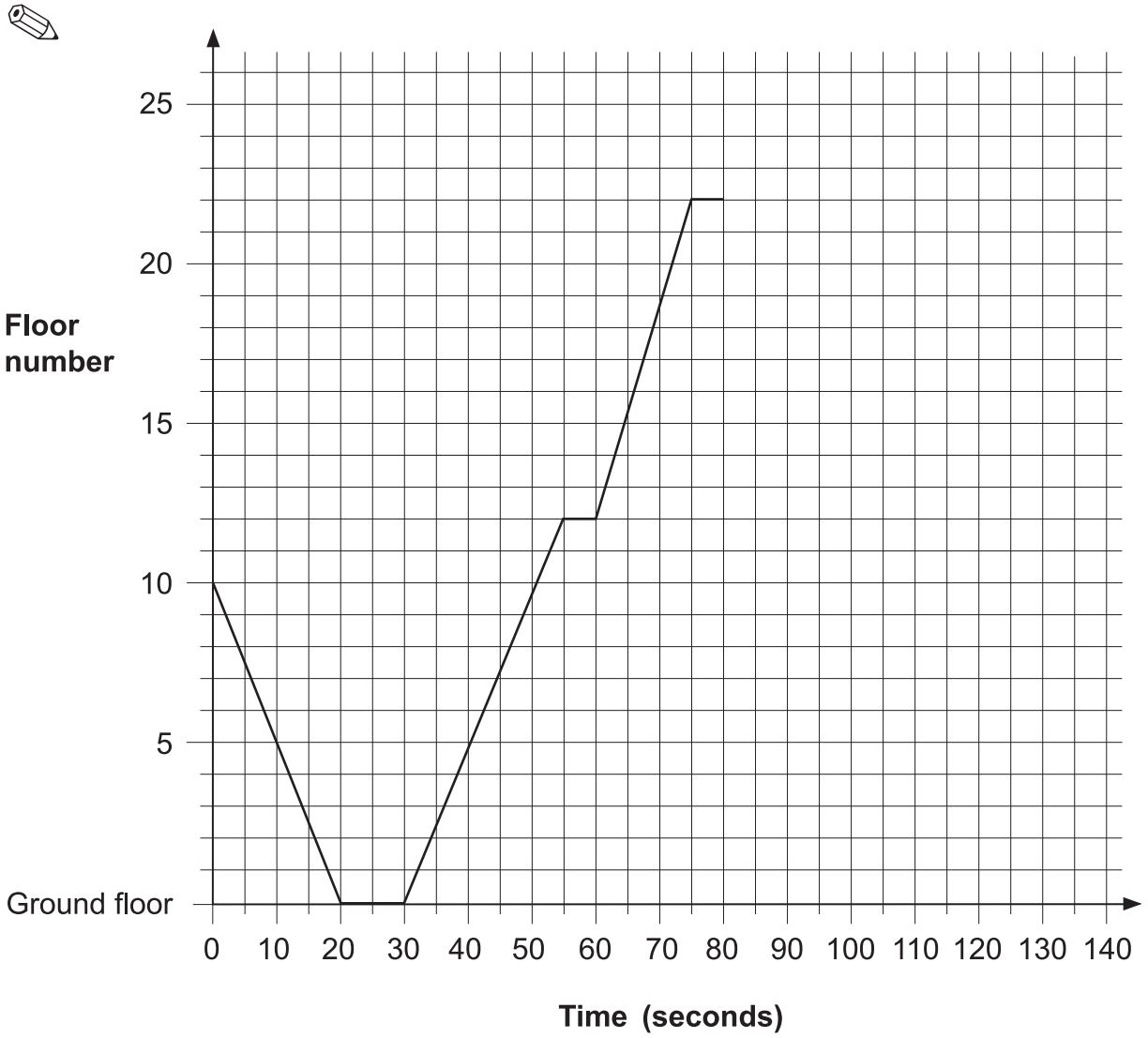
Generally, female teachers will tend to be younger than male teachers. ☐

Explain how you used the chart to decide.

. . . .
1 mark

8. The graph shows my journey in a lift.

I got in the lift at floor number 10



(a) The lift stopped at two different floors before I got to floor number 22

What floors were they?

floors . . . . . and . . . .

1 mark

(b) For how long was I in the lift while it was moving?

. . . . . seconds

1 mark

(c) After I got out of the lift at floor number 22, the lift went directly to the ground floor.

It took **45 seconds**.

On the graph, show the journey of the lift from floor 22 to the ground floor.

1 mark

9. (a) Paula played four games in a competition.
In **three** games, Paula scored **8** points each time.
In the other game she scored **no** points.

What was Paula's **mean** score over the **four** games?

. . . . . points . . . .
1 mark

(b) Jessie only played **two** games.
Her **mean** score was **3** points.
Her **range** was **4** points.

What points did Jessie score in her two games?

. . . . . and . . . .
1 mark

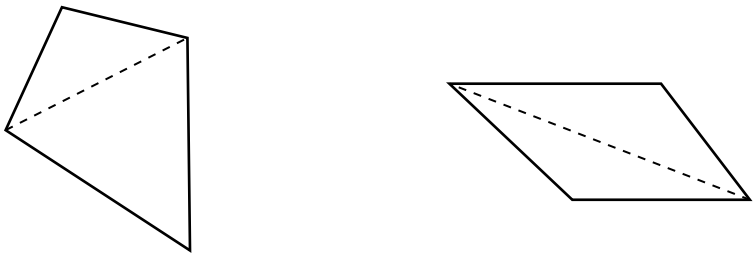
(c) Ali played **three** games.
His **mean** score was also **3** points.
His **range** was also **4** points.

What points might Ali have scored in his three games?
Show your working.

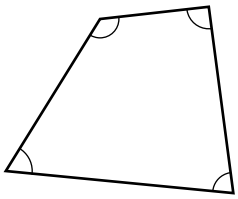
. . . .

. . . . . and . . . . . and . . . .
2 marks

10. (a) Any quadrilateral can be split into 2 triangles.

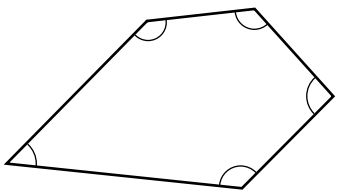


Explain how you know that the angles inside a **quadrilateral** add up to **360°**



. . . . .
1 mark

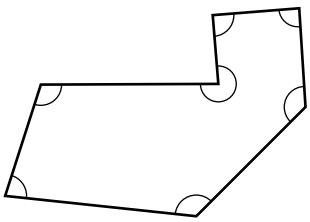
(b) What do the angles inside a **pentagon** add up to?



. . . . . °
. . . . .
1 mark

(c) What do the angles inside a **heptagon** (7-sided shape) add up to?

Show your working.



. . . . . °
. . . . .
. . . . .
2 marks

11. A garden centre sells plants for hedges.
The table shows what they sold in one week.

Plants	Number of plants sold	Takings
Beech	125	£212.50
Leylandii	650	£2437.50
Privet	35	£45.50
Hawthorn	18	£23.40
Laurel	5	£32.25
Total	**833**	**£2751.15**

(a) What percentage of the total number of plants sold was **Leylandii**?
Show your working.

. . . .

. . . . . % . . . .
2 marks

(b) What percentage of the **total takings** was for Leylandii?
Show your working.

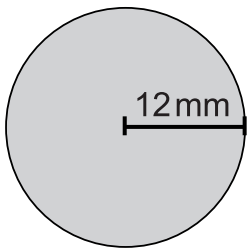
. . . .

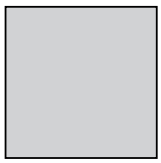
. . . . . % . . . .
2 marks

(c) Which is the **cheaper** plant, Beech or Privet?
Show working to explain how you know.

. . . .
1 mark

12. The diagram shows a circle and a square.





Not drawn accurately

(a) The radius of the circle is 12 mm.

What is the **area** of the circle to the nearest mm^2?

Show your working.

. . . .

. . . . . mm^2 . . . .

2 marks

(b) The **ratio** of the area of the **circle** to the area of the **square** is **2 : 1**

What is the area of the square to the nearest mm^2?

. . . . . mm^2 . . . .

1 mark

(c) What is the side length of the square?

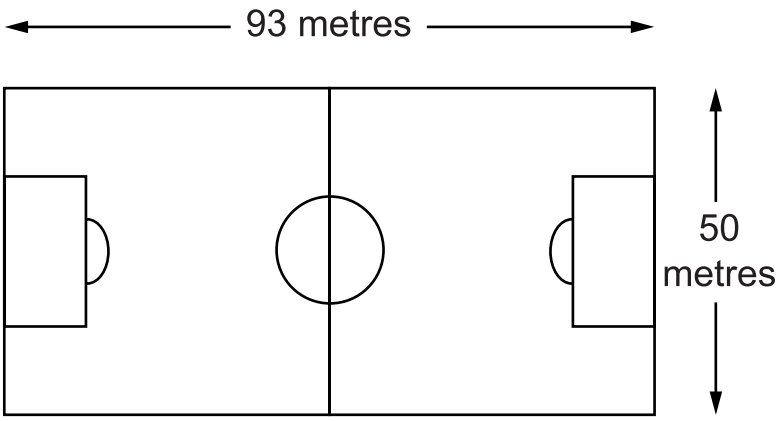
Show your working.

. . . .

. . . . . mm . . . .

2 marks

13. A groundsman marks out a football pitch.



(a) He makes the pitch 93 metres long, to the nearest metre.

What is the **shortest possible** length of the pitch?

. . . . . m

. . . .
1 mark

(b) He makes the pitch 50 metres wide, to the nearest metre.

What is the **shortest possible** width of the pitch?

. . . . . m

. . . .
1 mark

(c) Des wants to know how many times he should run around the outside of this pitch to be sure of running **at least 3km**.

Use your answer to parts (a) and (b) to find how many times Des should run around the pitch.

You **must** show your working.

. . . .

. . . .

. . . .
2 marks

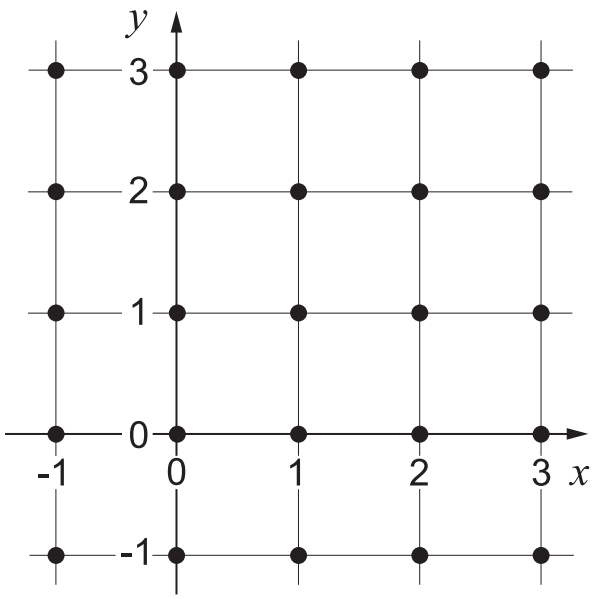
14. I am thinking of a point on the dotted grid below.
The co-ordinates of my point are (x, y)

You have 3 clues to find which of the dots is my point.

(a) **First clue:** $x > 0$ and $y > 0$

Which dots **cannot** represent my point?

On the grid below, **cross them out** like this ✕



. . . .

. . . .
2 marks

(b) **Second clue:** $x + y < 4$

Which other dots **cannot** represent my point?

This time, put a **square around them** like this ⊡

. . . .
1 mark

(c) **Third clue:** $x > y$

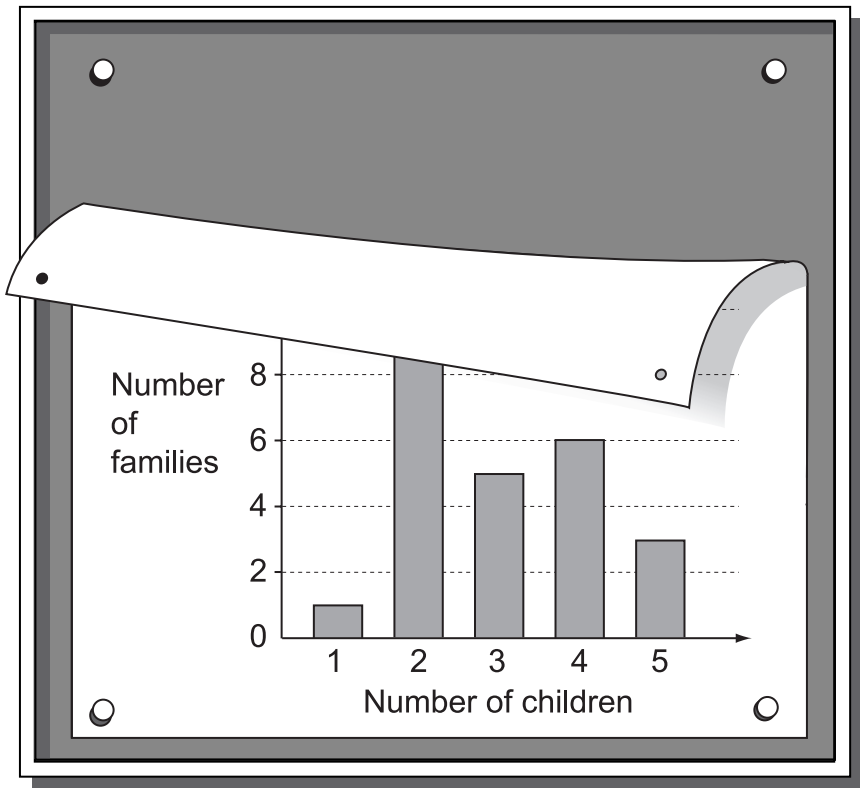
What are the co-ordinates of my point?

(,)

. . . .
1 mark

15. A class collected information about the number of children in each of their families.

The information was displayed in a frequency chart, but you cannot see all the information.



Call the number of families that have **two** children n

(a) Show that the **total** number of children in all the families is $55 + 2n$

. . . .
1 mark

(b) Write an expression for the **total number of families**.

. . . .
1 mark

(c) The **mean** number of children per family is **3**

What is the value of n?

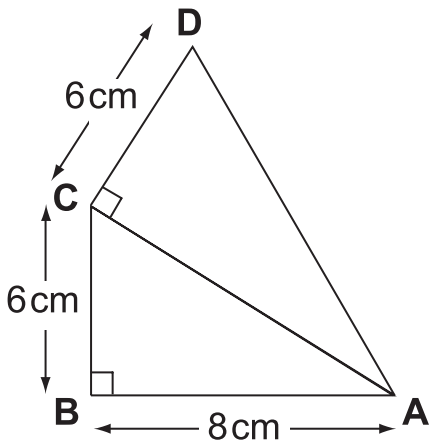
Show your working.

✎

n = ...

2 marks

16. ABC and ACD are both right-angled triangles.



Not drawn accurately

(a) Explain why the length of AC is 10 cm.

. . . .

1 mark

(b) Calculate the length of AD

Show your working.

. . . .

. . . . . cm

. . . .

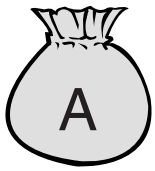
2 marks

17. I have two bags of counters.

Bag A contains

12 red counters and

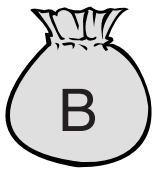
18 yellow counters.



Bag B contains

10 red counters and

16 yellow counters.



I am going to take one counter at random from either bag A or bag B

I want to get a **red** counter.
Which bag should I choose?

Show working to explain your answer.

. . . .

. . . .

2 marks