Mathematics
Third Practice Test 2

Levels 5-7
Calculator 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.

First name _____

Last name _____

School _____

Remember

- The test is 1 hour long.
- You may use a calculator for any question in this test.
- You will need: pen, pencil, rubber, ruler, angle measurer or protractor and a scientific or graphic calculator.
- 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. Marks may be awarded for working.
- Check your work carefully.
- Ask your teacher if you are not sure what to do.

_____

Instructions

Answers

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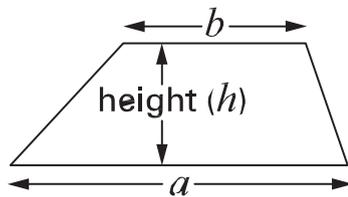
Calculators

You **may** use a calculator to answer any question in this test.

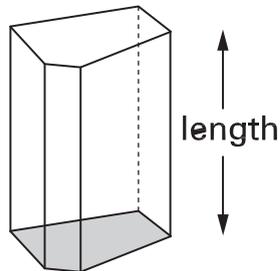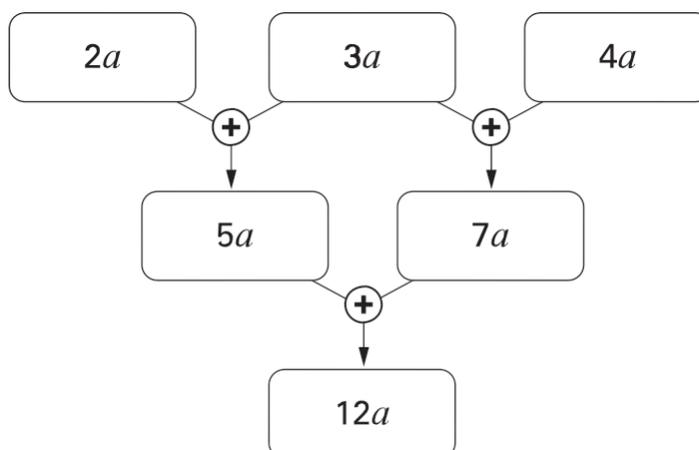## Formulae
You might need to use these formulae

Trapezium

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

Prism
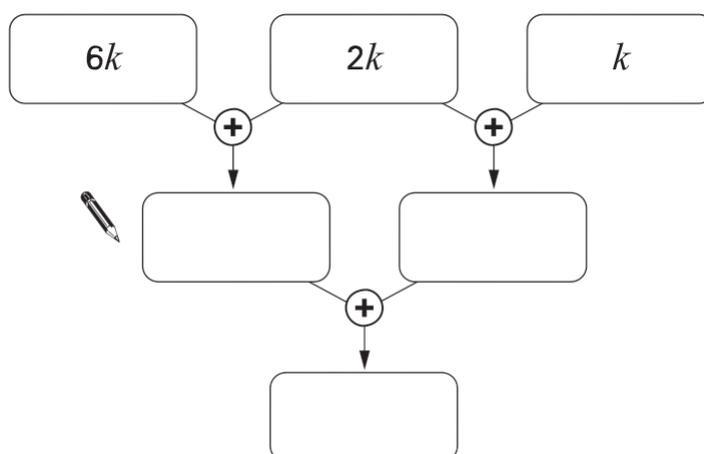
length

Volume = area of cross-section **t** length

1. Look at this algebra grid.

| 2a | | 3a | | 4a |

5a   7a

12a

Complete the algebra grids below, simplifying each expression.

| 6k | | 2k | | k |

| 2a + 3b | | 4a + 2b | | |

7a + 5b
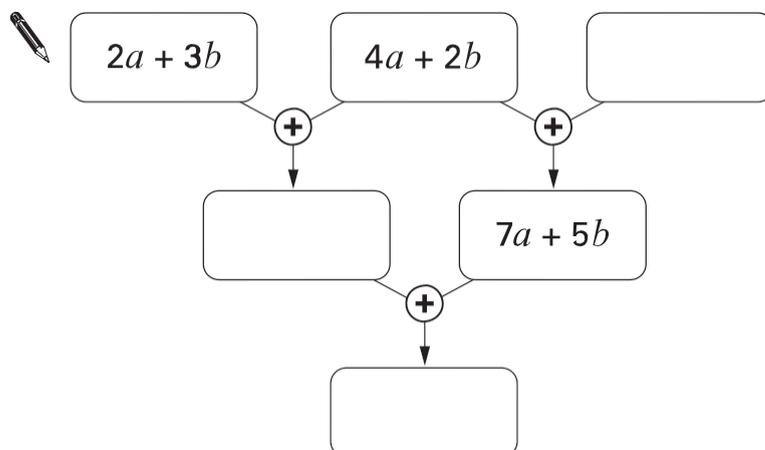
2. Look at this information.

In 1976, a man earned £16 each week.

The pie chart shows how he spent his money.
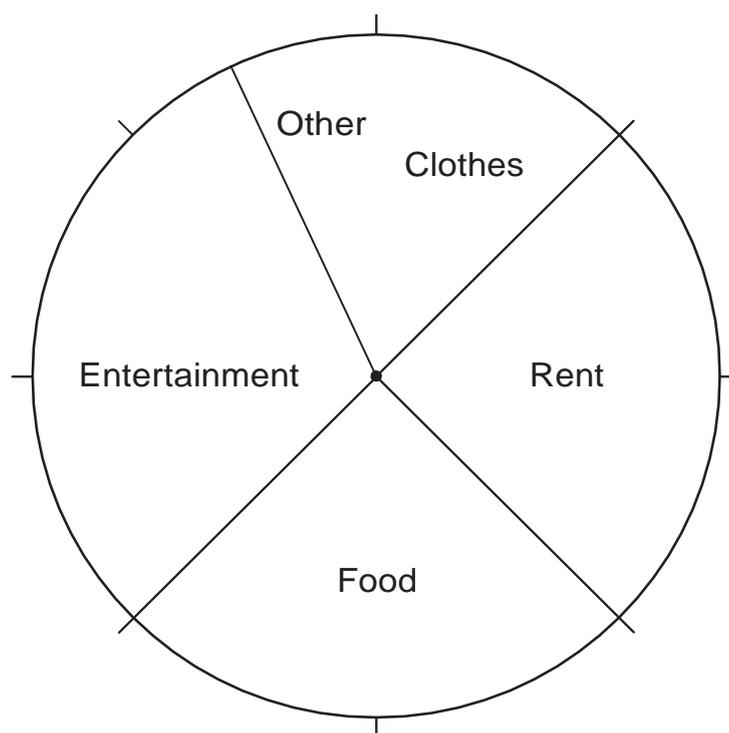
(a) How much did the man spend on **food** each week?

£

1 mark

(b) Now look at this information.

In 2002, a man earned £400 each week.

The table shows how he spent his money.

Rent	£200
Food	£100
Entertainment	£50
Other	£50

Complete the pie chart below to show how the man spent his money.

Remember to **label** each sector of the pie chart.
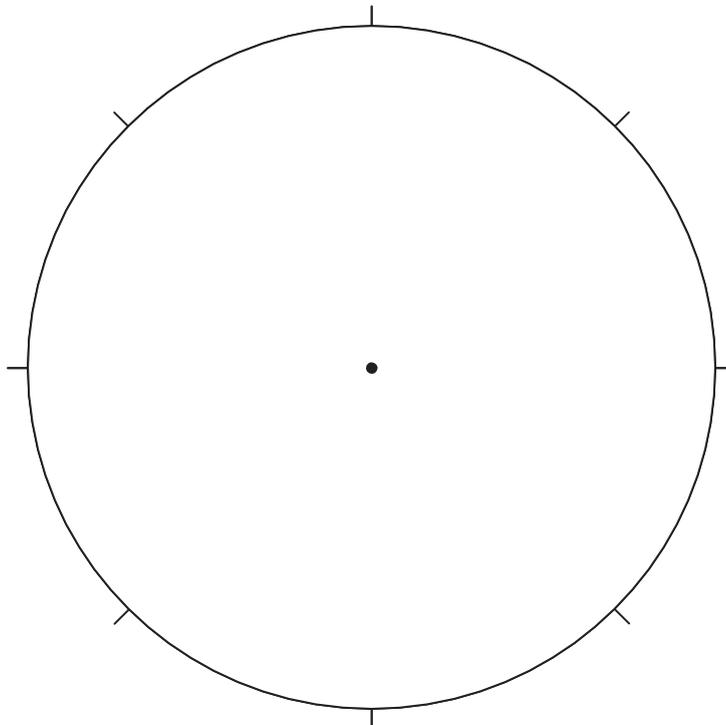
2 marks

3.   Two shops sell packs of pens.

| Supermarket |
| Pack of 5 pens |
| £6.25 |

| Village shop |
| Pack of 6 pens |
| £7.20 |

I want to buy **30 pens**.

In which shop are the pens cheaper?

You **must** show your working.

Tick (✓) your answer.

☐ Supermarket   ☐ Village shop

2 marks

4. (a) Aidan puts 2 white counters and 1 black counter in a bag.

○ ○ ●
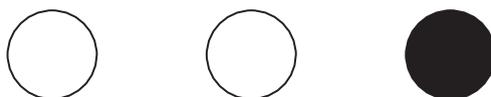
He is going to take one counter without looking.

What is the **probability** that the counter will be **black**?

1 mark

(b) Aidan puts the counter back in the bag and then puts **more black** counters in the bag.

He is going to take one counter without looking.

The **probability** that the counter will be black is now $\frac{2}{3}$

How many more black counters did Aidan put in the bag?

1 mark

5.   The scale drawing shows the positions of London and Paris.

North
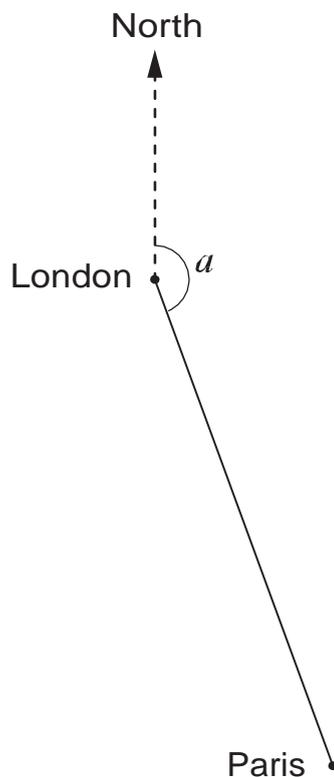
London $\quad a$

Paris

(a) From London to Paris, the angle from north is angle a

Measure accurately angle a

$a =$ .... °

1 mark

(b) On the scale drawing, **1cm represents 50km**.

What is the distance, in km, from London to Paris?

.... km

1 mark

8

(c) A newspaper printed this information about London and Madrid.

> From London to Madrid, the angle from north is **195° clockwise**.
>
> Madrid is **1300 km** from London.

Show this information on a scale drawing.

Use the scale **1 cm represents 200 km**.

The position of London is shown for you.

North

London
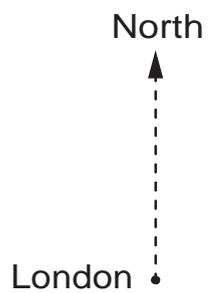
6. Work out the number of boys and girls in each class below.

(a) In class 8M, there are **27 pupils**.

There are **twice as many boys** as girls.

Number of boys	Number of girls
- - - - - - -	- - - - - - -

1 mark

(b) In class 8K, there are **28 pupils**.

There are **two more boys** than girls.

Number of boys	Number of girls
- - - - - - -	- - - - - - -

1 mark

(c) In class 8T, there are **9 boys**.

The ratio of boys to girls is **1 : 2**

Number of boys	Number of girls
- - - - - - -	- - - - - - -

1 mark

7.   Here are three lines on a centimetre square grid.

Draw two more lines on the grid to make a **pentagon** that has
an **area** of **14 cm^2**
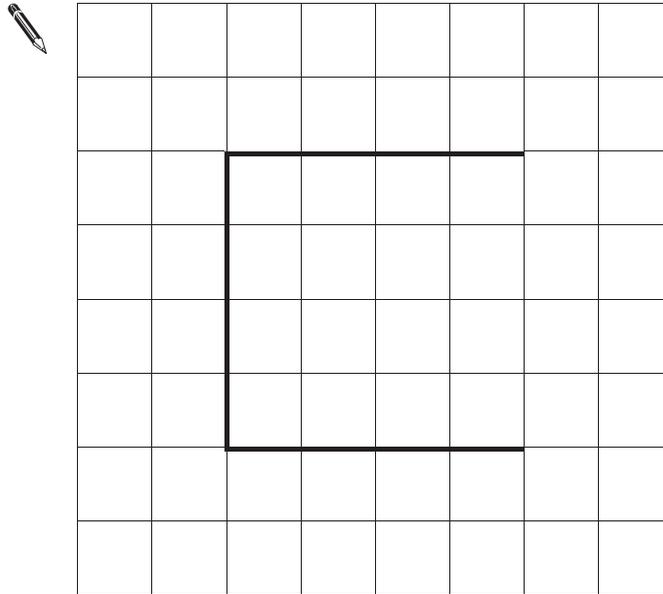
1 mark

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8.   Use your calculator to work out the answers.

$(48 + 57)$ **t** $(61 - 19)$ = ...

1 mark

$$\frac{48 + 57}{61 - 19} = $$ ....

1 mark

11

9. Each year, there is a tennis competition in Australia and another one in France.

The table shows how much money was paid to the winner of the men's competition in each country in 2002.

Country	Money
Australia	1 000 000 Australian dollars (£1 = 2.70 Australian dollars)
France	780 000 Euros (£1 = 1.54 Euros)

Which country paid **more** money?

You **must** show your working.

Tick (✓) the country that paid more.

☐ Australia   ☐ France

2 marks

10. **Look at the rectangle drawn on a square grid.**

Draw an enlargement of this rectangle with scale factor 2

Use point A as the centre of enlargement.

A
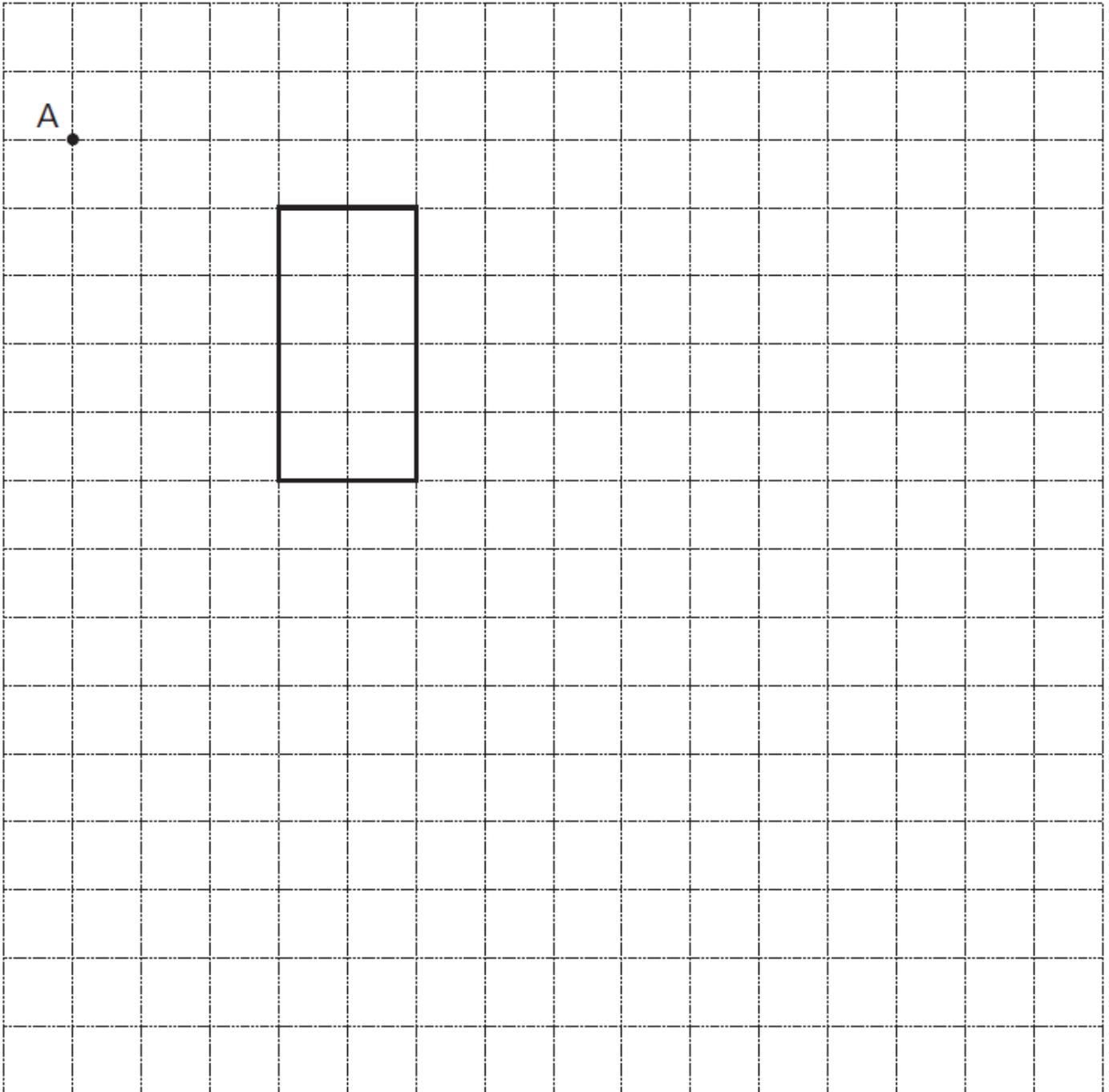
11. About 2000 years ago, a Greek mathematician worked out this formula to find the area of any triangle.

> For a triangle with sides a, b and c
>
> Area $= \sqrt{s(s-a)(s-b)(s-c)}$
>
> where $s = \dfrac{a+b+c}{2}$

A triangle has sides, in cm, of 3, 5 and 6

Use $a = 3$, $b = 5$ and $c = 6$ to work out the area of this triangle.

$$\boxed{} \ \text{cm}^2$$

12. Here is some information about all the pupils in class 9A.

	girls	boys
right-handed	13	14
left-handed	1	2

A teacher is going to choose a pupil from 9A at random.

(a) What is the probability that the pupil chosen will be a **girl**?

1 mark

(b) What is the probability that the pupil chosen will be **left-handed**?

1 mark

(c) The teacher chooses the pupil at random.

She tells the class the pupil is **left-handed**.

What is the probability that this left-handed pupil is a **boy**?

1 mark

15

13.   The screens of widescreen and standard televisions look different.

They have different proportions.

| Widescreen television | Standard television |

Ratio of height to width
is **9 : 16**

Ratio of height to width
is **3 : 4**
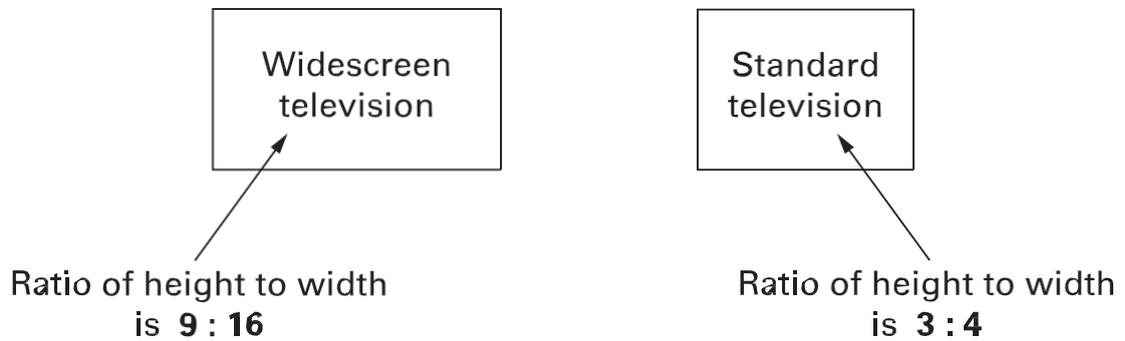
Keri starts to draw scale drawings of the televisions.

For each, the height is 4.5 cm.

What should the **width** of each scale drawing be?
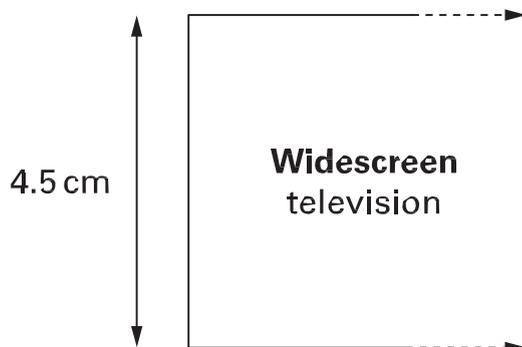
4.5 cm   **Widescreen** television

The width of this scale drawing

should be .... cm

1 mark

4.5 cm   **Standard** television
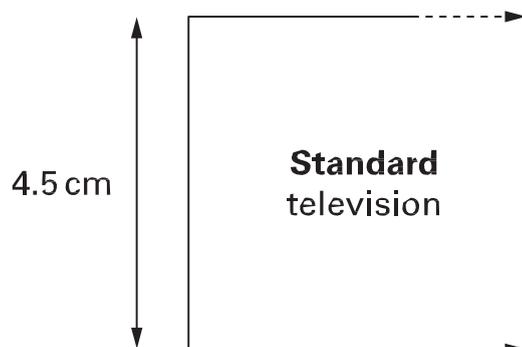
The width of this scale drawing

should be .... cm

1 mark

14.   A spinner has the numbers 1 to 4 on it.

> The probability of spinning a number 4 is 0.1
>
> The probability of spinning a number 1 is 0.6
>
> The probability of spinning a number 2 is the same as
> the probability of spinning a number 3

Calculate the probability of spinning a **number 3**

15.   I think of a number.

I multiply this number by **8**, then subtract **66**

The result is twice the number that I was thinking of.

What is the number I was thinking of?

16.   Here is some information about A levels in 2002.

	English	Mathematics
Number of students	72 000	54 000
Percentage gaining grade A	19%	37%

How many more students gained grade A in mathematics than in English?

2 marks

17. (a) Look at this equation.

$$14y - 51 = 187 + 4y$$

Is **y = 17** the solution to the equation?

☐ Yes   ☐ No

Show how you know.

(b) Now look at this equation.

$$3y^2 = 2601$$

Is **y = 17** a solution to the equation?

☐ Yes   ☐ No

Show how you know.

18. Write these expressions as simply as possible.

$9 - 3k + 5k = $ ....

$k^2 + 2k + 4k = $ ....

$3k \ \mathbf{t} \ 2k = $ ....

$\dfrac{9k^2}{3k} = $ ....

19. In one week Jamal watched television for **26 hours**.

In that week:

> He watched television for the **same** length of time
> on Monday, Tuesday, Wednesday and Thursday.
>
> On each of Friday, Saturday and Sunday,
> he watched television for **twice as long** as on Monday.

How long did he spend watching television on **Saturday**?

Write your answer in hours and minutes.

.... hours   .... minutes

2 marks

20. Here are four charts drawn by a computer.

Charts to show the average amount of milk
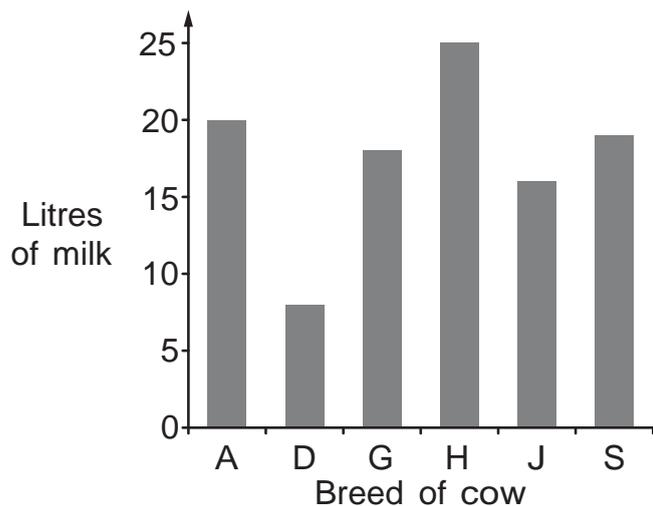**produced by different breeds of cow**

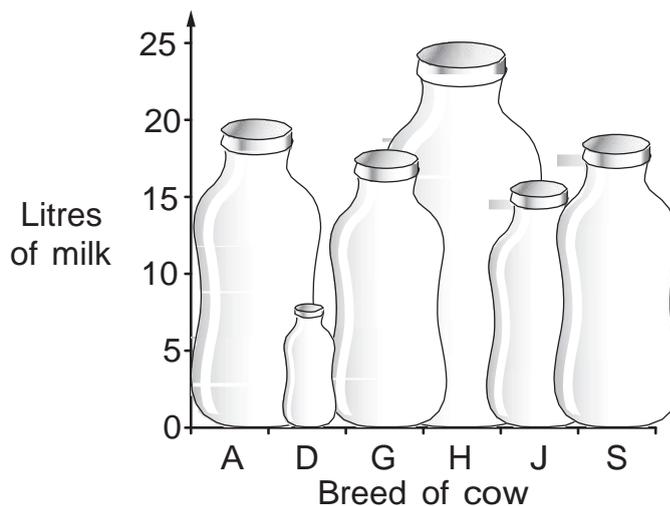**Chart 1**

Chart 2

Chart 3

Chart 4

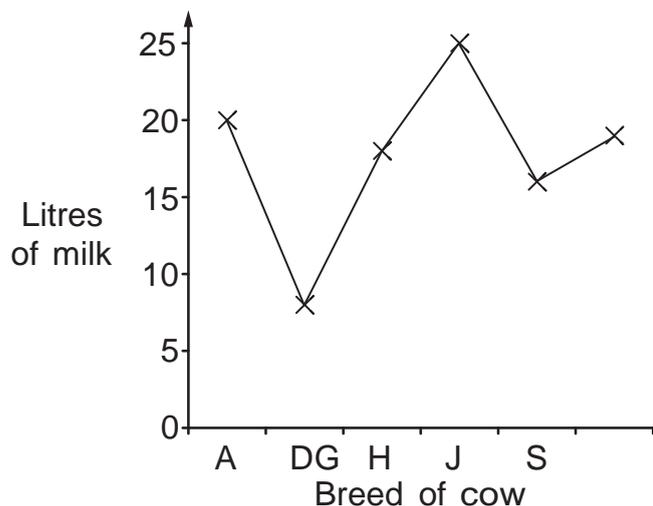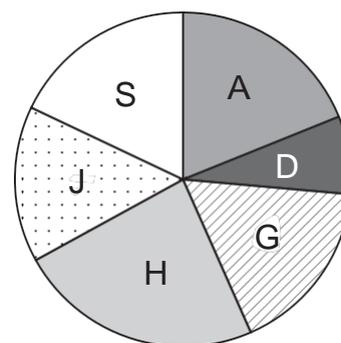**Key:**

A - Ayrshire   D - Dexter   G - Guernsey   H - Holstein   J - Jersey   S - Shorthorn

Only one of these charts is a good way of showing the data.

For each of the other three charts, explain why the type of chart is **not** a good way of showing the data.

Chart ....

because ....

- -

- -

Chart ....

because ....

- -

- -

Chart ....

because ....

- -

- -

21. (a) The nth term of a sequence is $3n + 4$

What is the **8th** term of this sequence?

- - - - - - - - - - - - -

(b) The nth term of a different sequence is $\dfrac{n-2}{n^2}$

Write the first **three** terms of this sequence.

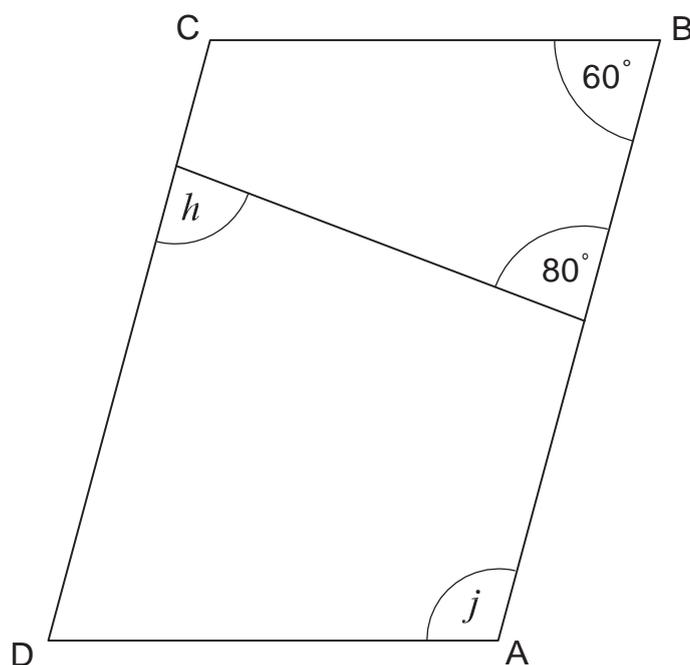**22.**   Multiply out the brackets in these expressions.

$y\,(y - 6) = $ ....

$(k + 2)(k + 3) = $ ....

23.   ABCD is a **parallelogram**.

C ┌──────── B
   60°

   h

   80°

                    j
D ──────────── A

Not drawn
accurately

Work out the sizes of angles h and j

Give reasons for your answers.

$h =$ ....° because ....

....

....

....

1 mark

$j =$ ....° because ....

....

....

....

1 mark

25

**24.** A newspaper printed this information about the world's population.

> If the world was a village of 100 people,
>
> **6 people** would have **59%** of the total wealth.
>
> The other 94 people would have the rest.

On average, **how many times** as wealthy as one of the other 94 people would one of these 6 people be?

2 marks

As reported in the Metro newspaper, Feb 2001

25. The diagram shows two circles and a square, ABCD.

A and B are the centres of the circles.

The radius of each circle is **5 cm**.
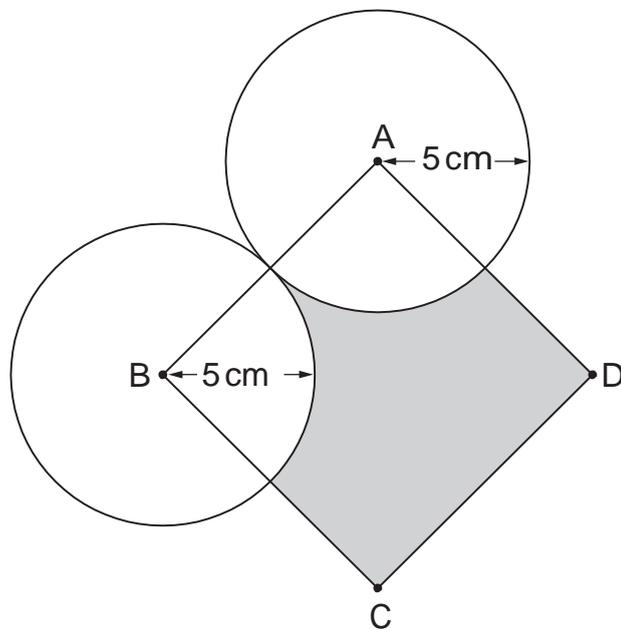
Not drawn
accurately

Calculate the area of the **shaded part** of the square.

2 marks

1 mark

END OF TEST