AQA

Please write clearly in block capitals.

Centre number | | | | | | Candidate number | | | | |

Surname _____

Forename(s) _____

Candidate signature _____

I declare this is my own work.

GCSE MATHEMATICS

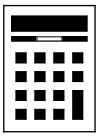
F

Foundation Tier Paper 2 Calculator

Thursday 3 November 2022 Morning Time allowed: 1 hour 30 minutes

Materials

For this paper you must have:
- a calculator
- mathematical instruments
- the Formulae Sheet (enclosed).



Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- If you need extra space for your answer(s), use the lined pages at the end of this book. Write the question number against your answer(s).
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer book.

Advice

In all calculations, show clearly how you work out your answer.

For Examiner's Use	
Pages	Mark
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	
TOTAL	

Answer **all** questions in the spaces provided.

Do not write outside the box

1 Circle the number that is a multiple of 25

[1 mark]

55 65 75 85

2 Circle the value of the digit 3 in the number 10.23

[1 mark]

$\frac{3}{1000}$ $\frac{3}{100}$ $\frac{3}{10}$ 3

0·03

3 Circle the lowest of these temperatures.

[1 mark]

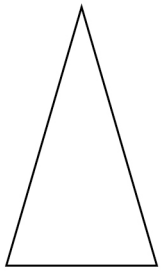
–2.1°C 0.4°C –5°C 1°C

Do not write outside the box

4 Circle the letter of the shape that has **exactly one** line of symmetry.

[1 mark]

P



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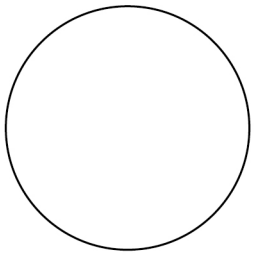

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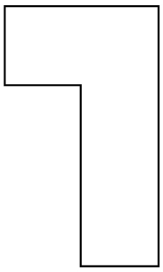

Turn over for the next question

4

Do not write outside the box

5 (a) Simplify fully $d \times d$

$d^{1+1} = d^2$

[1 mark]

Answer d^2 (1)

5 (b) Simplify fully $n \div n$

$n^{1-1} = n^0 = 1$

[1 mark]

Answer 1 (1)

5 (c) Simplify fully $\frac{1}{3} \times 6t$

$\frac{6t}{3} = 2t$

[1 mark]

Answer $2t$ (1)

Do not write outside the box

6 (a) Write a number in the box to make the calculation correct.

[1 mark]

$$16 \div \boxed{1000} = 0.016$$

(1)

6 (b) Write a number in the box to make the calculation correct.

[1 mark]

$$18.4 + 3.9 + \boxed{4.7} = 27$$

22.3

(1)

$27 - 22.3 = 4.7$

6 (c) Write a fraction in the box to make the calculation correct.

[1 mark]

$$\frac{1}{2} \times \boxed{\frac{1}{4}} = \frac{1}{8}$$

(1)

6 (d) Write the **same** number in both boxes to make the calculation correct.

[1 mark]

$$\boxed{19} \times \boxed{19} = 361$$

(1)

$x^2 = 361$

$x = \sqrt{361}$

$= 19$

7

Do not write outside the box

7 Three groups of people, A, B and C, have taken driving tests.

7 (a) Here is information about the number of tests taken by the people in A.

Group A

Key: ○ represents 4 people

One test	○ ○ ○ 12
Two tests	○ ○ ○ ○ 16
Three tests	○ C 6

Here is information about the number of tests taken by the people in B.

One test Half the number in A who have taken one test.

Two tests 4 fewer than the number in A who have taken two tests.

Three tests 10 more than the number in A who have taken three tests.

Complete this pictogram for the people in B.

[3 marks]

Group B

Key: ○ represents 4 people

One test	○ C (1)	$\frac{12}{2} = 6$
Two tests	○ ○ ○ (1)	$16 - 4 = 12$
Three tests	○ ○ ○ ○ (1)	$6 + 10 = 16$

Do not write outside the box

7 (b) In group C there are 25 people.

17 of these people have passed a test.

One person is picked at random from C.

Work out the probability that the person has **not** passed a test.

[2 marks]

People not passed a test = 25 − 17 = 8 (1)

$\frac{8}{25}$

Answer $\frac{8}{25}$ (1)

8 Work out the value of $3r + 4t$ when $r = 13$ and $t = -2$

[2 marks]

3(13) + 4(−2) (1)

= 39 − 8

= 31 (1)

Answer 31

Turn over for the next question

7

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9 Hamish has saved 295 coins.

Each one is a 20p coin.

He gives an equal number of 20p coins to each of his 8 grandchildren.

He gives them as many coins as possible.

How much, in £, does he have left?

[4 marks]

295 ÷ 8 = 36.875 (1)

He gives each grandchild 36 coins

36 x 0.20 = £7.20 each (1)

Total he gives : £7.20 x 8 = £57.60

Total he has initially : 295 x 0.20 = £59 (1)

Total he has left : 59 - 57.60 = 1.40 (1)

Answer £ 1.40

Do not write outside the box

10 Here are two sets of numbers.

Set A	2	12	13	27
Set B	1	15	16	30

One number from Set A is swapped with one number from Set B.

The total of the numbers in each set is now the same.

Which two numbers are swapped?

[2 marks]

Total Set A : 2 + 12 + 13 + 27 = 54

Total Set B : 1 + 15 + 16 + 30 = 62

difference = 8 (1)

swap number difference should be 4.

∴ 12 and 16

Answer 12 and (1) 16

11 Rearrange $m = p - 5$ to make p the subject.

Circle your answer.

p = m + 5

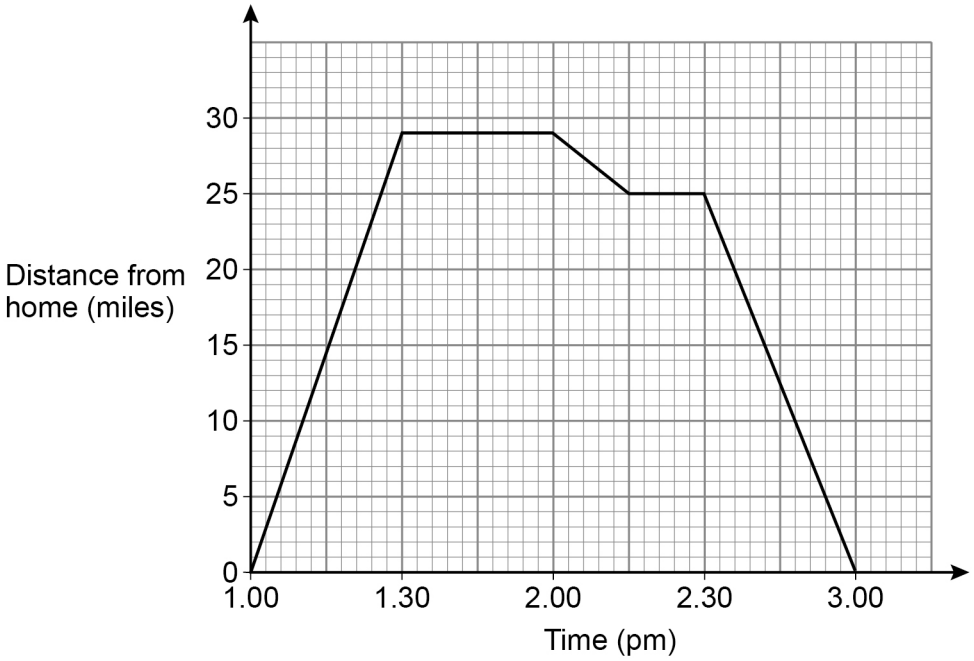
[1 mark]

$p = \frac{m}{5}$ $\quad$ $p = m + 5$ (1) $\quad$ $p = 5m$ $\quad$ $p = m - 5$

7

Do not write outside the box

12 Here is the distance-time graph for a car between 1 pm and 3 pm



12 (a) Work out the **total** time that the car is **not** moving between 1 pm and 3 pm

State the units of your answer.

[2 marks]

1.30 pm to 2.00 pm and 2.15 pm to 2.30 pm

30 mins and 15 mins (1)

= 45 mins (1)

Answer 45 minutes

12 (b) Work out the **total** distance the car travels between 1 pm and 3 pm

[2 marks]

29 + 4 + 25 = 58

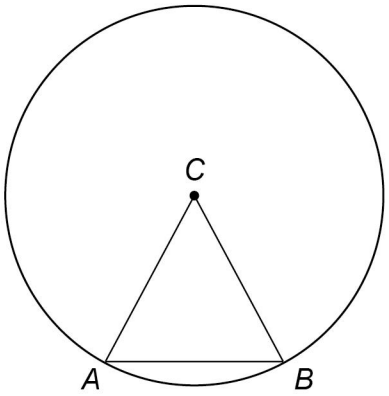
(1) (1)

Answer 58 miles

Do not write outside the box

13 *A* and *B* are points on a circle.

C is the centre of the circle.



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Tick **one** box for each statement.

[3 marks]

	Definitely true	**Might be true**	**Cannot be true**
Line *AB* is a tangent to the circle	☐	☐	☑ (1)
AC is an arc of the circle	☐	☐	☑ (1)
Triangle *ABC* is equilateral	☐	☑ (1)	☐

Turn over for the next question

7

Do not write outside the box

14 To travel to a festival, a group of people will hire a minibus.

This formula has all costs in £

$$\text{Cost per person} = \frac{165 + \text{cost of the minibus}}{\text{number of people in the group}}$$

14 (a) With 12 people in the group, the cost of the minibus will be £567

Work out the cost per person.

[2 marks]

$\text{Cost per person} = \frac{165 + 567}{12}$ (1)

$= \frac{732}{12} = 61$ (1)

Answer £ 61

14 (b) With 15 people in the group, they will hire a different minibus.

The cost per person will be £50

Work out the cost of this minibus.

[3 marks]

$50 = \frac{165 + \text{cost}}{15}$ (1)

$\text{cost} = 50 \times 15 - 165$

$= 750 - 165$ (1)

$= 585$ (1)

Answer £ 585

Do not write outside the box

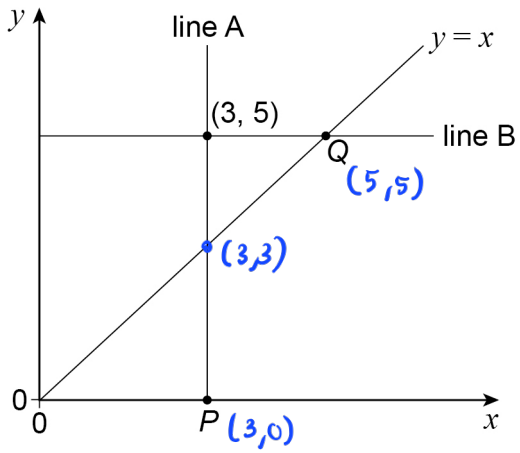
15 The sketch shows

the line $y = x$

line A, which is vertical

line B, which is horizontal.

The point (3, 5) is on both line A and line B.



Write down the coordinates of *P* and *Q*.

[2 marks]

P (3 , 0) (1) *Q* (5 , 5) (1)

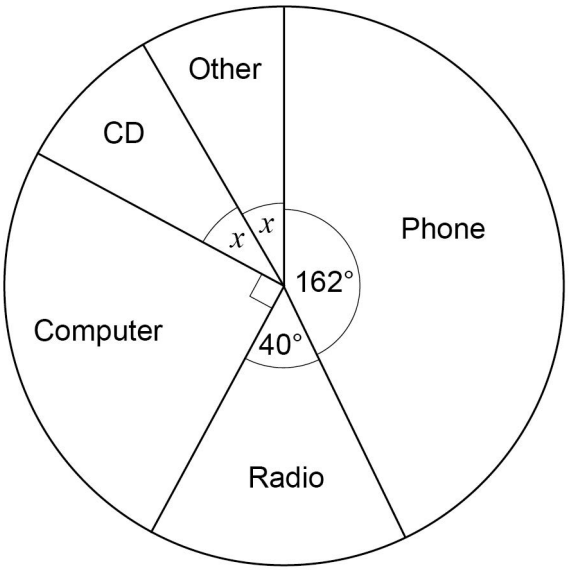
Turn over for the next question

7

Do not write outside the box

16 Some people were asked for the main way they listen to music.

A pie chart is drawn to represent their answers.



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16 (a) Work out the size of angle x.

[2 marks]

$2x + 90 + 40 + 162 = 360$ (1)

$2x + 292 = 360$

$2x = 68$

$x = 34$ (1)

Answer 34 degrees

Do not write outside the box

16 (b) 135 people said Computer.

How many people said Phone?

[3 marks]

$\frac{135}{90} \times 162 = 1.5 \times 162$ (1) (1)

$= 243$ (1)

Answer 243

17 Complete this statement.

[1 mark]

$10^8 =$ 100 (1) million

$1 \times 10^8 = 100\,000\,000$

$= 100$ million

Turn over for the next question

6

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18 A football team plays two matches.

18 (a) For the first match, 40 000 tickets are sold.

Assume that each ticket costs £38.50

Work out the total amount of money from ticket sales for this match.

[2 marks]

40000 x 38.50 = 1 540 000 (1) (1)

Answer £ 1 540 000

18 (b) In fact, for the first match,

some of the tickets cost less than £38.50

and

some of the tickets cost more than £38.50

What does this mean about the total amount of money from ticket sales for this match?

Tick **one** box.

[1 mark]

- ☐ It will be more than the answer to part (a)
- ☐ It will be the same as the answer to part (a)
- ☐ It will be less than the answer to part (a)
- ☑ It is not possible to tell (1)

Do not write outside the box

18 (c) For the second match, the number of tickets sold increases from 40 000 to 55 000

Is the increase in tickets sold **more** than 35% ?

You **must** show your working.

[3 marks]

55 000 − 40 000 = 15 000 (1)

$\frac{15\,000}{40000} \times 100\% = 37.5\%$ (1) (1)

Yes. It is more than 35%.

19 On a train, there are between 60 and 70 people.

The ratio of adults to children is 5 : 4

Work out the **total** number of people on the train.

[2 marks]

Total ratio = 5 + 4 = 9 (1)

Total number should be divisible by 9.

= 63 ÷ 9 = 7

Answer 63 (1)

8

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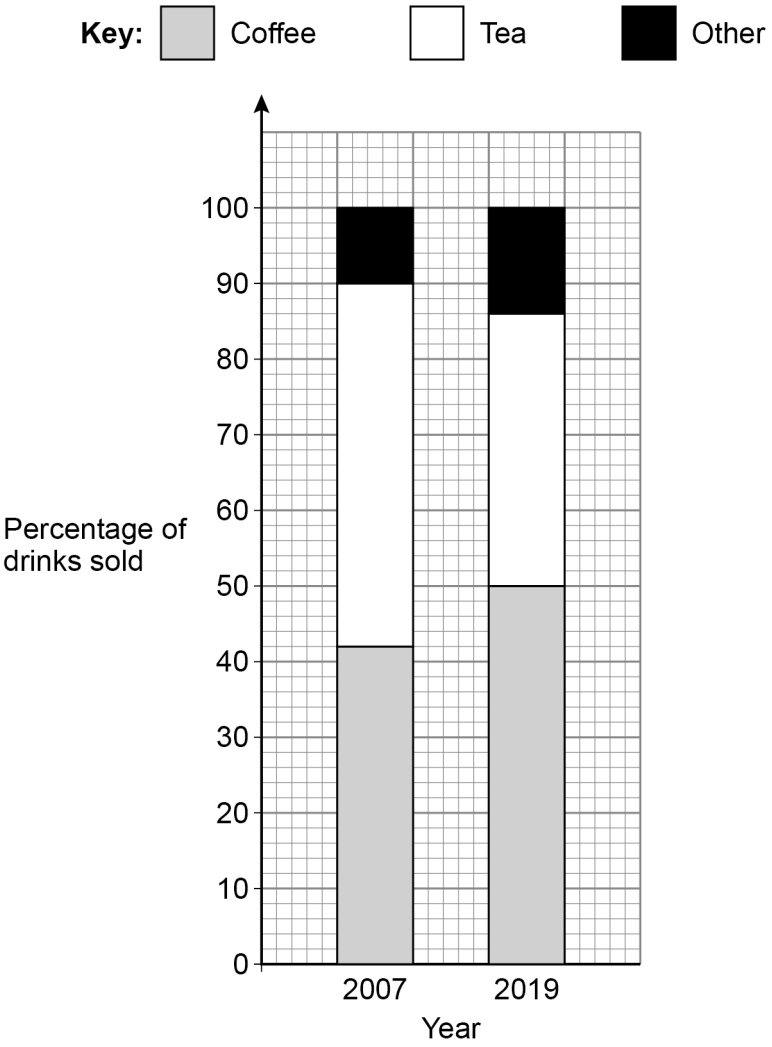
20 The composite bar chart shows information about the **percentage** of drinks sold by a café in 2007 and 2019



20 (a) In 2007 the café sold a total of 24 000 drinks.

How many **more** teas than coffees were sold?

[2 marks]

Tea : 90 - 42 = 48 %

Coffee : 42 %

48 - 42 = 6 % (1)

$\frac{6}{100} \times 24000 = 1440$

Answer 1440 (1)

Do not write outside the box

20 (b) Were more coffees sold at the café in 2019 than in 2007 ?

Tick a box.

☐ Yes ☐ No ☑ Cannot tell (1)

Give a reason for your answer.

[1 mark]

The total numbers sold in 2019 were unknown. (1)

21 (a) k is a whole number between 40 and 50

The cube root of k is 3, to the nearest whole number.

Work out the **largest** possible value of k.

[2 marks]

$3.5^3 = 42.875$ (1)

$k = 42$

Answer 42 (1)

21 (b) Fay tries to solve $x^2 = 100$

She says,

"The only possible value of x is 10"

Give a reason why she is **not** correct.

[1 mark]

x could also be -10 (1)

6

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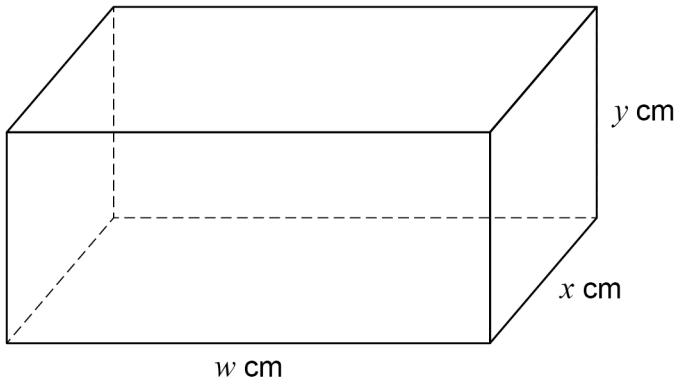
22 (a) Here is a cuboid.

w, x and y are **different** whole numbers.



The total length of **all** the edges of the cuboid is 80 cm

The volume is **greater** than 200 cm^3

Work out one possible set of values for w, x and y.

[2 marks]

$4w + 4y + 4x = 80$

$4(w + x + y) = 80$

$w + x + y = 20$

$w \times y > 200$

let $w = 8$, $x = 7$, $y = 5$

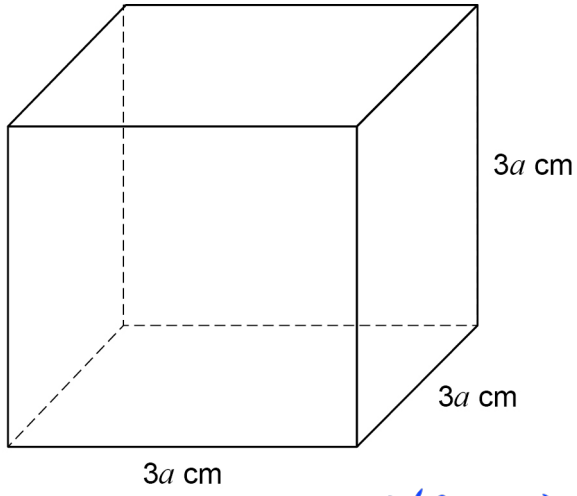
$8 + 7 + 5 = 20$, $8 \times 7 \times 5 = 280$

(2)

$w =$ 8 $x =$ 7 $y =$ 5

Do not write outside the box

22 (b) Here is a solid cube.



$6(3a \times 3a)$

$6(9a^2)$

$54a^2$

Circle the expression for the **total** surface area in cm^2

[1 mark]

$36a$ $54a$ $36a^2$ $54a^2$

1

23 The equation of a line is $y = 3x - 6$

Circle the coordinates of the y-intercept.

[1 mark]

(0, –6) (–6, 0) (0, 3) (3, 0)

1

4

Do not write outside the box

24 (a) Work out $2.8^4 + \sqrt{158.76}$

Give your answer as a decimal.

[2 marks]

$2.8^4 = 61.4656$

$\sqrt{158.76} = 12.6$

$61.4656 + 12.6 = 74.0656$

Answer 74.0656 (2)

24 (b) Work out $\dfrac{6.09 \times 10^{14}}{4.2 \times 10^{9}}$

Give your answer in standard form.

[2 marks]

$\frac{6.09}{4.2} \times 10^{14-9}$

1.45×10^5

Answer 1.45×10^5 (2)

25 A tank contains 40 litres of water.

25 (a) Water leaks out of the tank at a rate of 1.2 litres per minute.

The leak is stopped after 20 minutes.

Show that, when the leak is stopped, the tank contains 16 litres of water.

[1 mark]

Total water leaks : $1.2 \times 20 = 24$ litres (1)

$40 - 24 = 16$

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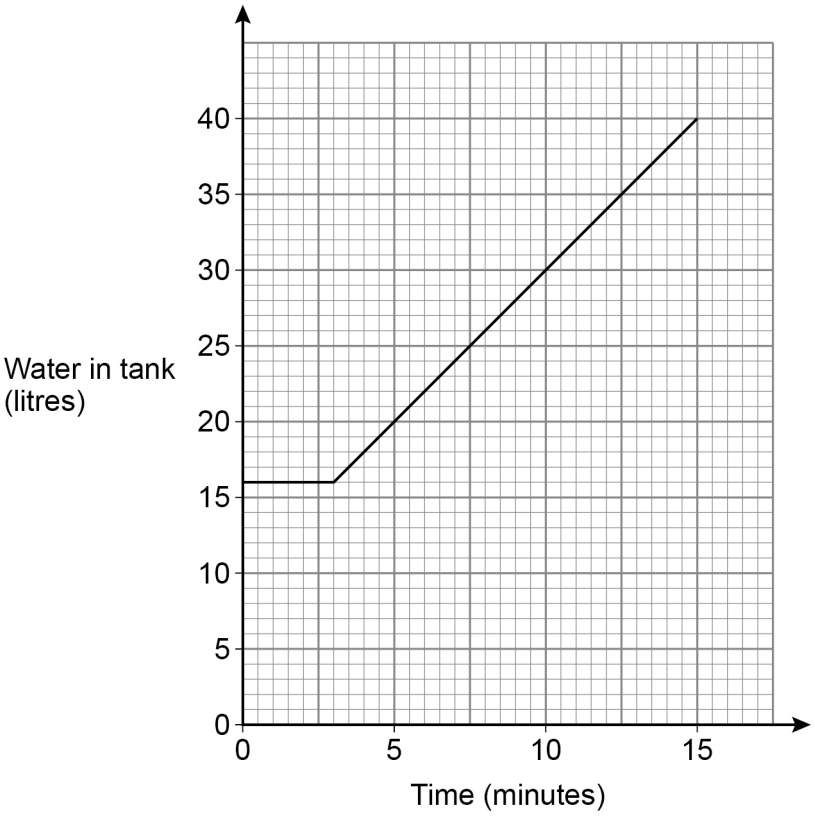
25 (b) The tank is refilled with water from a tap.

The graph shows the amount of water in the tank **after** the leak is stopped.



Complete this report by writing a number in each answer space.

[3 marks]

Report

3 (1) minutes after the leak is stopped, the tap starts to refill the tank.

The rate at which the tank refills is 2 litres per minute.

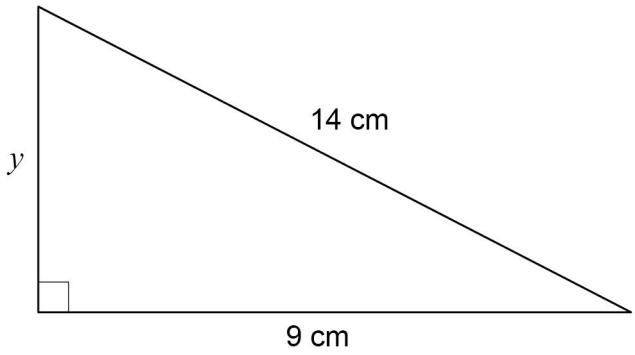
$\frac{40-16}{15-3} = \frac{24}{12} = 2$ (1) (1)

8

Turn over ►

Do not write outside the box

26 Here is a triangle.



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Use Pythagoras' theorem to work out the value of y.

Give your answer as a decimal.

[3 marks]

$y^2 = 14^2 - 9^2$

$= 196 - 81$

$= 115$ (1)

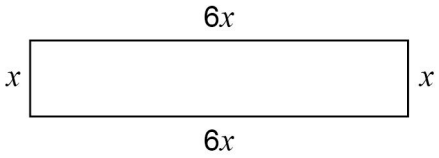
$y = \sqrt{115}$ (1)

$= 10.72$ (1)

$y =$ 10.72 cm

Do not write outside the box

27 The length of this rectangle is 6 times the width.



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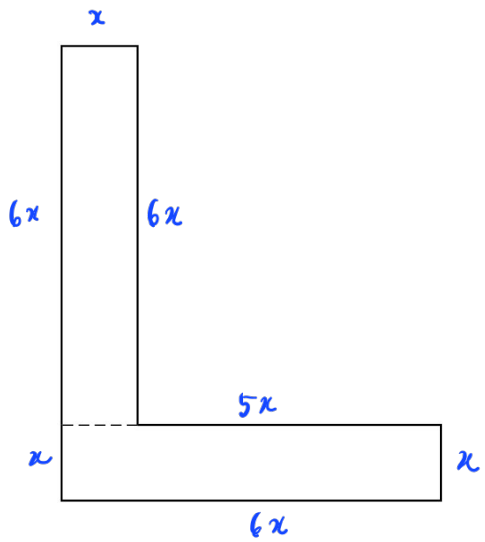
Two of these rectangles are joined, with no overlap, to make this L-shape.



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The perimeter of the L-shape is 98.8 cm

Work out the value of the perimeter of **one** of the rectangles.

[4 marks]

$6x + x + 6x + 5x + x + 6x + x = 98.8$

$26x = 98.8$ (1)

$x = 98.8 \div 26$ (1)

$= 3.8$

Perimeter of one rectangle : $x + x + 6x + 6x$

$= 14x = 14(3.8)$ (1)

$= 53.2$ (1)

Answer 53.2 cm

7

Do not write outside the box

28 Written as the product of prime factors,

$12\,600 = 2^3 \times 3^2 \times 5^2 \times 7$

and

$14\,112 = 2^5 \times 3^2 \times 7^2$

Work out the highest common factor (HCF) of 12 600 and 14 112

Give your answer as an integer.

[2 marks]

HCF : $2^3 \times 3^2 \times 7$ = $8 \times 9 \times 7$ (1)

= 504 (1)

Answer 504

END OF QUESTIONS

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