Please write clearly, in block capitals.

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

Surname _____

Forename(s) _____

Candidate signature _____

GCSE MATHEMATICS

F

Foundation Tier Paper 3 Calculator

Exam Date Morning Time allowed: 1 hour 30 minutes

Materials

For this paper you must have:

- a calculator
- mathematical instruments.

Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- 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.
- 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	

Do not write outside the box

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

1 What is the mode of these numbers?

3 4 6 6 7 8 9 13

Circle your answer.

[1 mark]

6 6.5 7 10

2 What is the value of 3 in the answer to 13.78 ÷ 100?

Circle your answer.

[1 mark]

3 300 0.3 0.03

3 What is the largest two-digit prime number?

Circle your answer.

[1 mark]

93 95 97 99

4 Which ratio is **not** equivalent to the ratio 3 : 4

Circle your answer.

[1 mark]

$\frac{3}{4}$: 1 1 : $\frac{4}{3}$ 1 : 1.3 6 : 8

Turn over for the next question

4

5 A stall sells drinks and sandwiches.

Drinks	£1.10 each
Sandwiches	£2.30 each

Offer

Drink and a sandwich

£3.25

A family buy 10 items altogether.

They buy **more** drinks than sandwiches.

They save 60p using the offer.

How much do they pay altogether?

[5 marks]

Answer £ _____

6 The sum of two numbers is 35

The second number is four times the first number.

Work out the two numbers.

[3 marks]

Answer _____, _____

Turn over for the next question

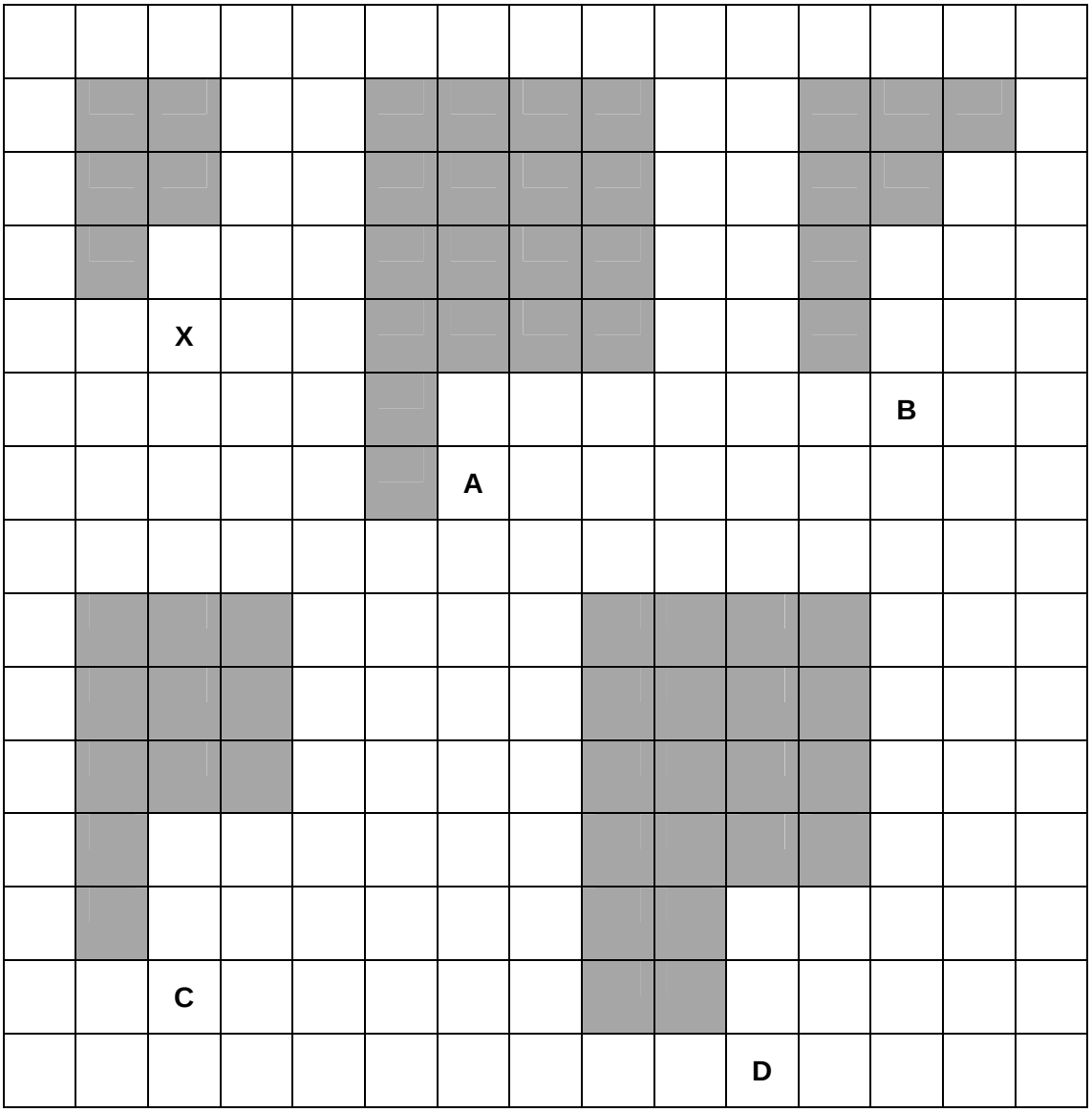
8

7 (a) Which of A, B, C or D is an enlargement of shape X?

Circle the correct letter.

[1 mark]

A B C D



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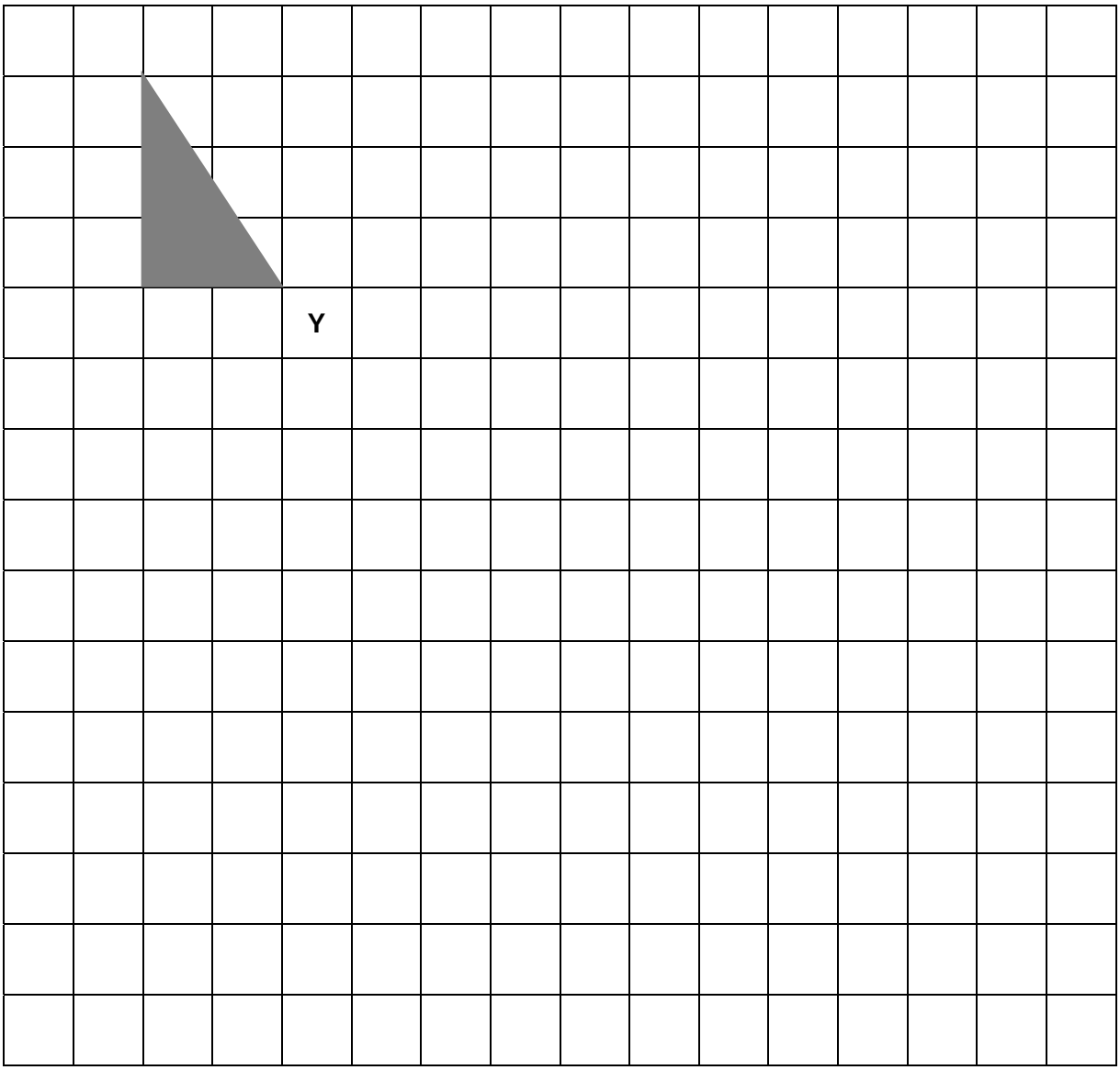
7 (b) On this grid, draw a shape that is a reflection of shape Y.

Show your mirror line.

[1 mark]



Turn over for the next question

2

8 A gas company estimates the amount a household will spend on gas next year.

Estimate = £1450 excluding VAT

VAT is added at 5%

The household wants to pay in 12 equal monthly instalments.

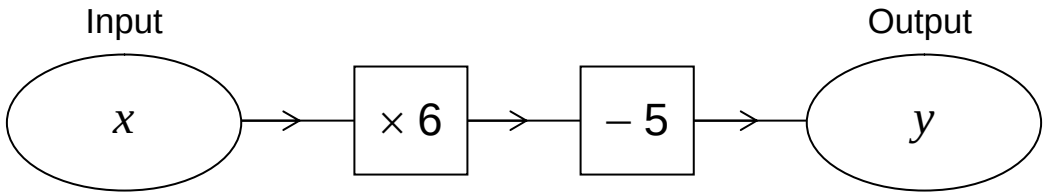
Is £130 per month enough to pay for this gas?

You **must** show your working.

[4 marks]

Answer _____

9 (a) Work out the output y when $x = 4$

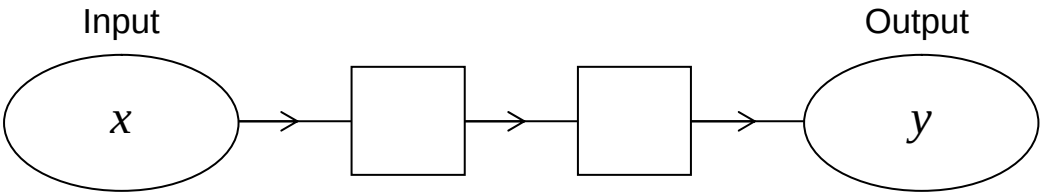


[1 mark]

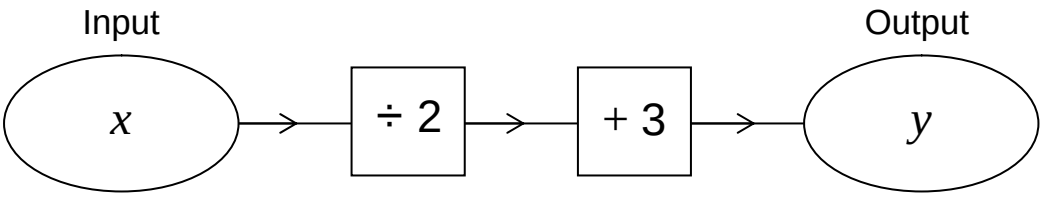
Answer _____

9 (b) Complete this number machine so that $y = 2(x + 7)$

[1 mark]



9 (c) Here is a different number machine.



Which equation is correct for this machine?

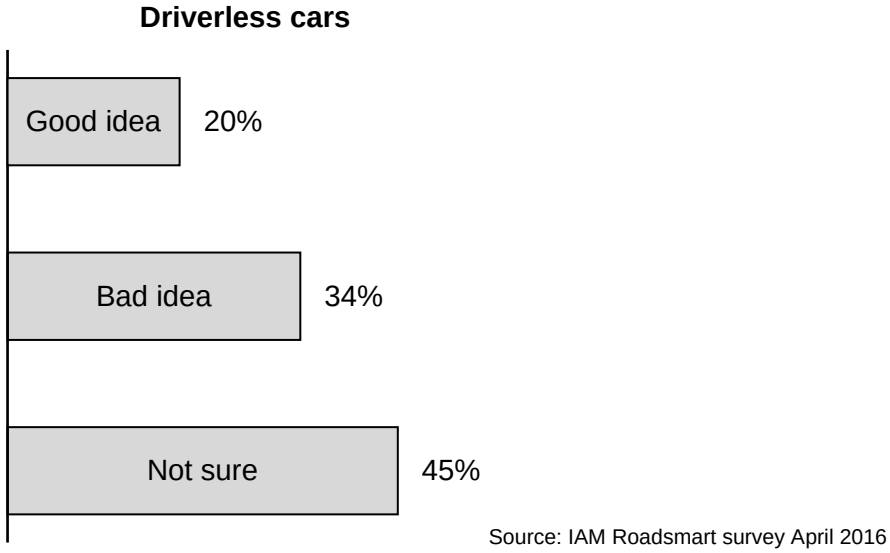
Circle your answer.

[1 mark]

$y = \frac{x}{2} + 3$ $\quad x = \frac{y}{2} + 3$ $\quad x = \frac{y + 3}{2}$ $\quad y = \frac{x + 3}{2}$

7

10 The diagram shows the results of a survey of 1000 British motorists.



Source: IAM Roadsmart survey April 2016

10 (a) How can you tell that the percentages are **not** exact figures?

[1 mark]

10 (b) Using the percentages given, how many of the motorists thought driverless cars were a bad idea?

[1 mark]

Answer _____

Do not write outside the box

10 (c) Assume the percentages are given to the nearest 1%. Work out the **largest** possible number of motorists who thought driverless cars were a good idea.

[2 marks]

Answer _____

Turn over for the next question

4

11 The table shows the savings for 30 students in one week.

Savings, £s	**Number of students**
$0 < s \leqslant 5$	2
$5 < s \leqslant 10$	14
$10 < s \leqslant 15$	9
More than 15	5

11 (a) How many students saved more than £5?

[1 mark]

Answer _____

11 (b) How many students did **not** save anything?

Circle your answer.

[1 mark]

0 1 2 cannot tell

12 Solve $20x = 4$

Circle your answer.

[1 mark]

$x = \frac{1}{5}$ $x = -16$ $x = 5$ $x = 80$

13 n is an odd number.

Tick any statements that are true.

[3 marks]

☐ $n^2 + 1$ is odd

☐ $n(n + 1)$ is odd

☐ $(n + 1)^2$ is odd

☐ $n^2 + 2$ is odd

☐ $n(n + 2)$ is odd

☐ $(n + 2)^2$ is odd

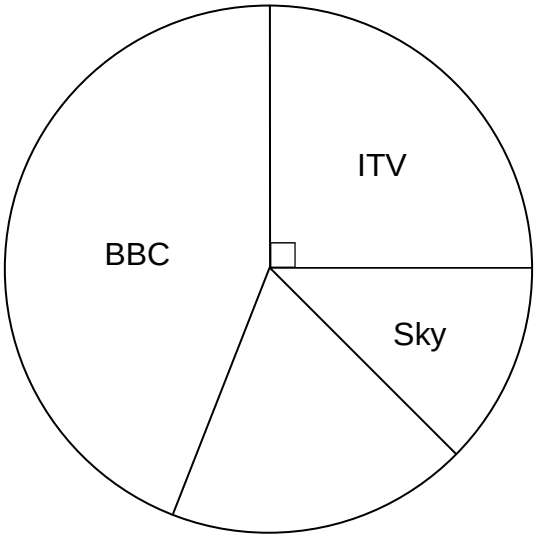
Turn over for the next question

6

14 Jack draws a pie chart to represent his time watching the news in January.

Altogether he watches 18 hours of news.

Time watching the news



14 (a) How many hours did he spend watching ITV news?

[2 marks]

Answer _____ hours

14 (b) Write down **one** criticism of his pie chart.

[1 mark]

14 (c) In February he also watches 18 hours of news.

He watches 10 hours on the BBC.

Jack says,

"This is more than in January because the pie chart shows I watched less than 9 hours of BBC news."

Comment on his statement.

[1 mark]

14 (d) In February he watches 2 hours of news on Sky.

Jack says,

"If I draw a pie chart for February the angle for Sky news will **no**t be a whole number of degrees. This is because $\frac{2}{18}$ is **not** a terminating decimal."

Is his statement correct?

Tick a box.

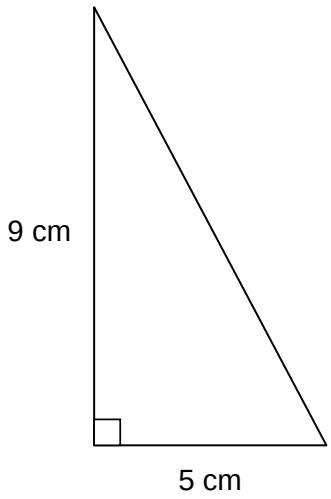
☐ Correct ☐ Not correct

You **must** show your working.

[2 marks]

6

15 This triangle is the cross section of a triangular prism of length 10 cm.



Not drawn accurately

Ali writes,

Volume = $9 \times 5 \times 10$

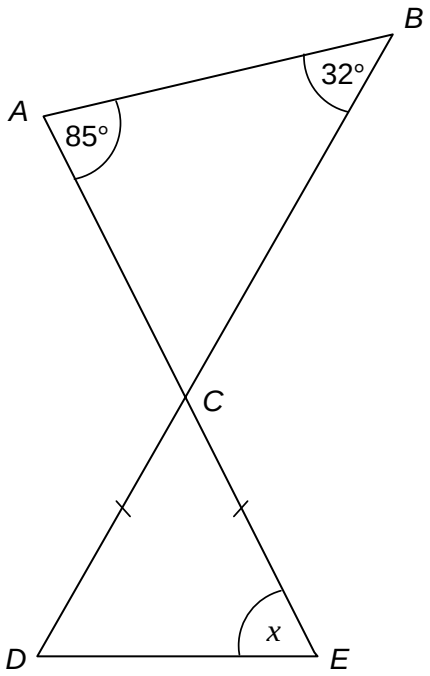
Volume = 450 cm

Check his working and write the correct solution.

[3 marks]

16 *ACE* and *BCD* are straight lines.

CD = *CE*



Not drawn accurately

Work out the size of angle *x*.

[3 marks]

Answer _____ degrees

6

17 On a map the distance between two towns is 6 cm

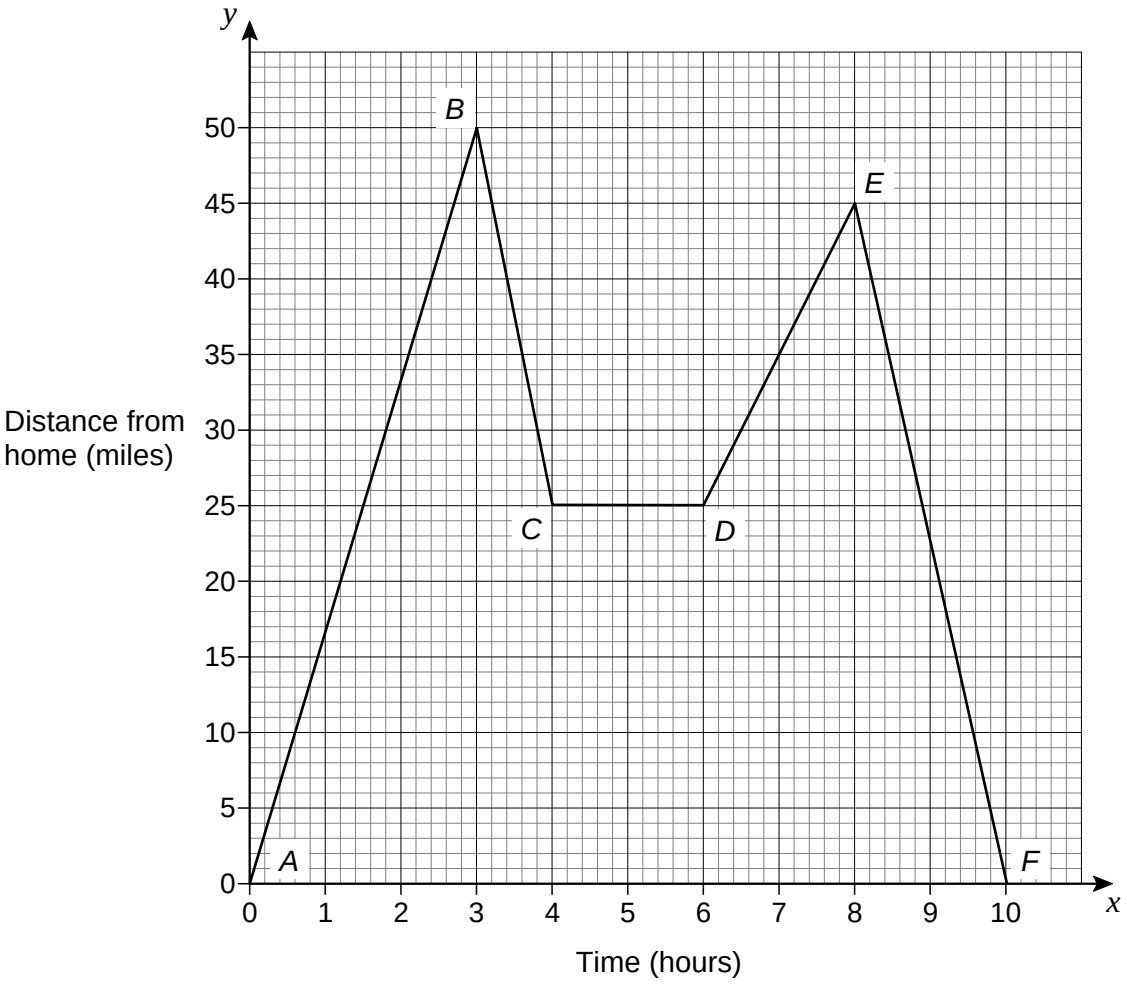
The actual distance is 1.2 km

Work out the scale of the map as a ratio in its simplest form.

[3 marks]

Answer _____ : _____

18 Here is a distance-time graph.



18 (a) Match each statement to one section of the journey.

[4 marks]

Average speed = 25 miles per hour _____ to _____

Average speed = 10 miles per hour _____ to _____

Stationary _____ to _____

Fastest part of the journey _____ to _____

18 (b) How far is the whole journey?

[2 marks]

Answer _____ miles

9

19 The direct route between two airports *A* and *B* is 450 km

An aircraft leaves *A* at 09.30

It arrives at *B* at 11.00

19 (a) Work out the average speed of the aircraft.

Assume the aircraft travelled the direct route.

[3 marks]

Answer _____ km/h

19 (b) In fact the aircraft did **not** travel the direct route.

How does this affect the average speed?

Tick a box.

☐ Faster ☐ Slower ☐ The same

Give a reason for your answer.

[2 marks]

Do not write outside the box

20 (a) Sam writes $\sqrt{13^2 - 5^2} = 13 - 5$

$= 8$

What is wrong with his method?

Give the correct answer.

[2 marks]

Answer _____

20 (b) Eva writes $4^2 \times 4^2 \times 4^2 = 4^{2 \times 2 \times 2}$

$= 4^8$

What is wrong with her method?

Give the correct answer.

[2 marks]

Answer _____

Turn over for the next question

9

21 (a) Write these numbers in ascending order.

9812 9.82×10^2 9.81×10^3

[1 mark]

Answer _____, _____, _____

21 (b) Jon is multiplying two numbers given in standard form.

$2 \times 10^6 \times 3 \times 10^7 = (2 \times 3) \times 10^{(6 + 7)}$

$= 6 \times 10^{13}$

He says,

"So, for any numbers

$a \times 10^b \times c \times 10^d = (a \times c) \times 10^{(b + d)}$

which will **always** be in standard form."

Is he correct that $(a \times c) \times 10^{(b + d)}$ will **always** be in standard form?

Tick a box.

☐ Correct ☐ Not correct

Show working to support your answer.

[2 marks]

22 (a) Factorise $x^2 - 9x + 20$

[2 marks]

Answer _____

22 (b) Solve $x^2 - 9x + 20 = 0$

[1 mark]

Answer _____

23 Solve the simultaneous equations

$3x + 2y = 10$

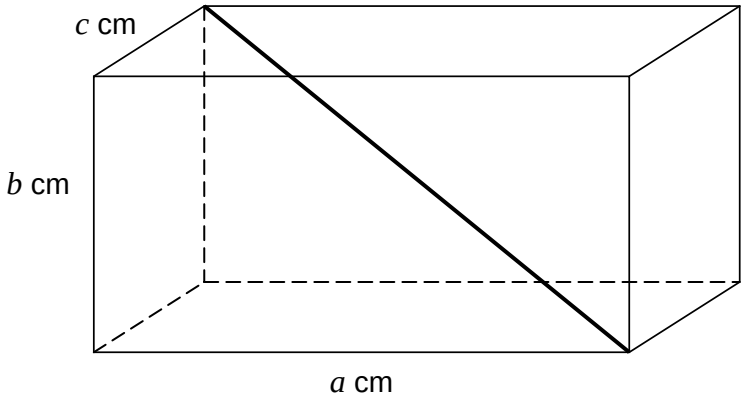
$3x - y = 13$

[3 marks]

Answer $x =$ _____ $y =$ _____

9

24 The diagram shows a cuboid and its diagonal.



The formula to work out the length of the diagonal in centimetres is

Length of diagonal = $\sqrt{a^2 + b^2 + c^2}$

24 (a) Work out the length of the diagonal when $a = 8$, $b = 3$ and $c = 2$

Give your answer to 2 significant figures.

[3 marks]

Answer _____ cm

24 (b) Work out the length of the diagonal in terms of a

when $b = 2a$ and $c = 2a$

[3 marks]

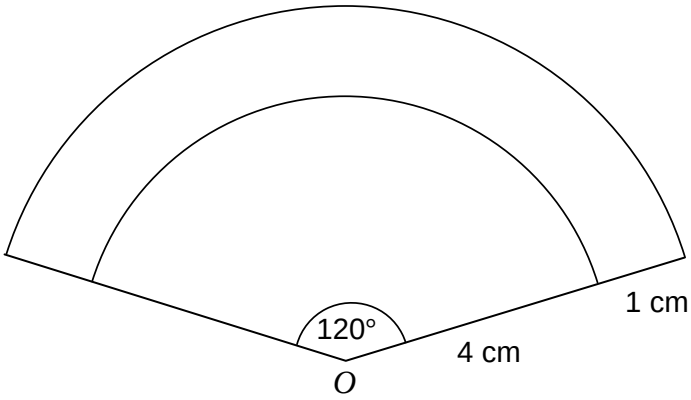
Answer _____ cm

Turn over for the next question

6

25 The diagram shows two circular arcs with centre O.

Not drawn accurately



How much longer is the big arc than the small arc?

Give your answer to 1 decimal place.

[4 marks]

Answer _____ cm

END OF QUESTIONS

4