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

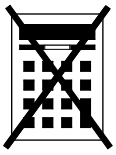
Foundation Tier Paper 1 Non-Calculator

Tuesday 1 November 2022 Morning Time allowed: 1 hour 30 minutes

Materials

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

You must **not** use a calculator.



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	
TOTAL	

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

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1 Circle the length of time between 4.00 pm and 5.05 pm

1 hour 5 mins

[1 mark]

55 min | 65 min | 105 min | 125 min

1

2 A circle has diameter 10 cm

Circle the radius.

[1 mark]

5 cm | 10 cm | 20 cm | 100 cm

1

3 Circle the percentage that is between $\frac{1}{2}$ and $\frac{3}{4}$

$\frac{1}{2} \times 100 = 50\%$ $\frac{3}{4} \times 100 = 75\%$

[1 mark]

40% | 60% | 80% | 90%

1

Do not write outside the box

4 Circle the value of $3^2 + 4^2$ 9 + 16 = 25

[1 mark]

14 17 25 (1) 49

5 Simplify fully $8a + 5b + 6a - 2b$

[2 marks]

8a + 6a + 5b - 2b

= 14a + 3b

Answer 14a + 3b (2)

Turn over for the next question

6

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6 200 students were each asked about the monthly cost of their phone contract.
Here are the results.

	Less than £25	**£25 or over**
School students	40	90
College students	32	38

6 (a) How many **more** school students than college students were asked?

[2 marks]

school : 40+90 = 130 college : 32 + 38 = 70 (1)

130 - 70 = 60 (1)

Answer 60

6 (b) What percentage of the 200 students had a monthly cost **less than £25** ?

[2 marks]

40+32 = 72

$\frac{72}{200} \times 100\% = 36\%$ (1) (1)

Answer 36 %

Do not write outside the box

7 The only animals on a farm are 30 cows and 80 sheep.

$\frac{1}{5}$ of the 30 cows are sold

and

$\frac{5}{8}$ of the 80 sheep are sold.

Work out the **total** number of animals that are sold.

[3 marks]

$\frac{1}{5} \times 30 = 6$ (1) $\quad \frac{5}{8} \times 80 = 50$ (1)

$6 + 50 = 56$ (1)

Answer 56

8 Some gamers were asked which type of video game they preferred.

65% said Action.

19% said Role-playing.

The rest said Sports.

What percentage said Sports?

[2 marks]

$100 - 65 - 19 = 16$ (1) (1)

Answer 16 %

9

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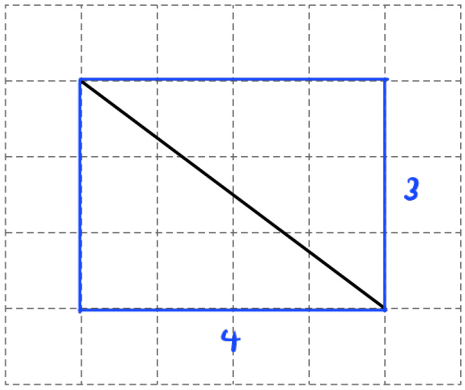
9 (a) A diagonal of a rectangle is drawn on a centimetre grid.
The sides of the rectangle are on the grid lines.



Work out the area of the rectangle.

[2 marks]

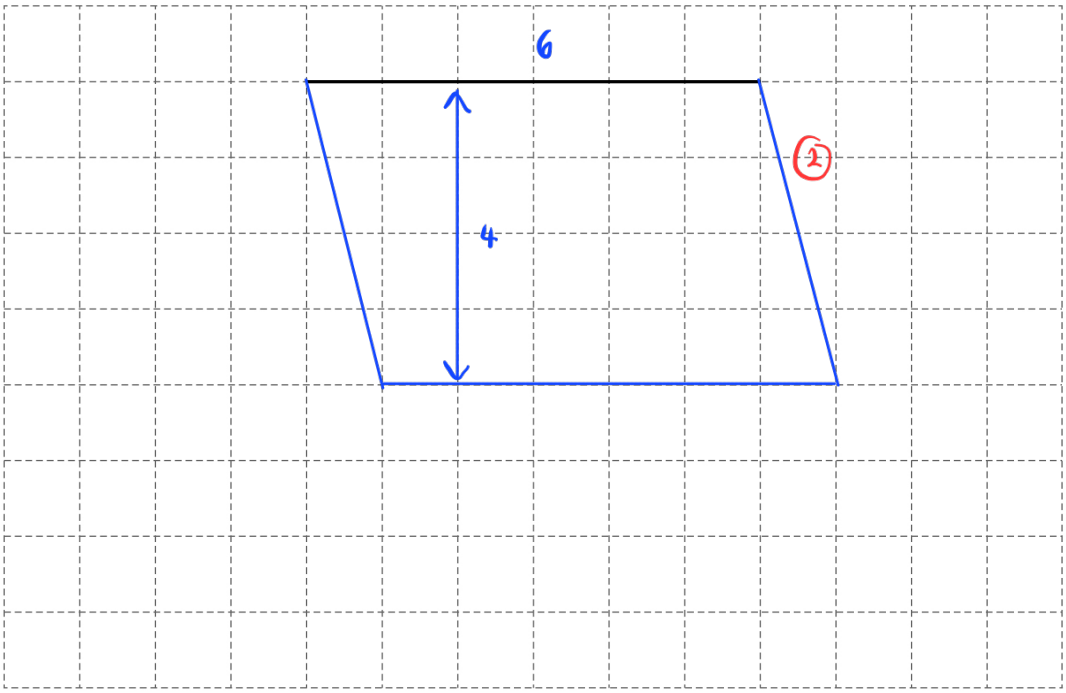
$4 \times 3 = 12$ (1) (1)

Answer 12 cm^2

9 (b) One side of a parallelogram is drawn on this centimetre grid.
The parallelogram does **not** have any right angles.

Complete the parallelogram so that it has area 24 cm^2

[2 marks]



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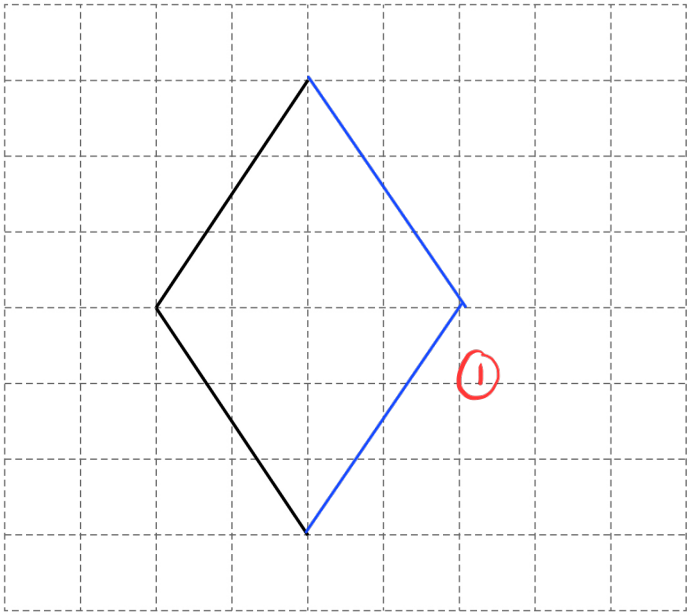
9 (c) Two sides of a rhombus are drawn on this grid.

Complete the rhombus.

[1 mark]



1

10 Here is a calculation.

$$428 \times 30 = 12\,840$$

Use the calculation to help answer the following questions.

10 (a) Write down the answer to $12\,840 \div 428$

[1 mark]

Answer 30 1

10 (b) Circle the answer to 214×30

[1 mark]

1284 3210 6420 25 680

1

7

Turn over ►

Do not write outside the box

11 A shop sells notebooks and pencils.

Notebooks	**Pencils**
Pack of 8 for £12	56p each or Pack of 6 for £2.70

11 (a) Marek buys some **packs** of notebooks.

The cost is £60

In total, how many **notebooks** does he buy?

[2 marks]

$\frac{60}{12} = 5$ packs (1)

$5 \times 8 = 40$ notebooks (1)

Answer 40

11 (b) Work out the cheapest cost of 10 pencils.

[3 marks]

option 1: $10 \times 0.56 = £5.60$ (1)

option 2: $4 \times 0.56 + £2.70 = £4.94$ (1)

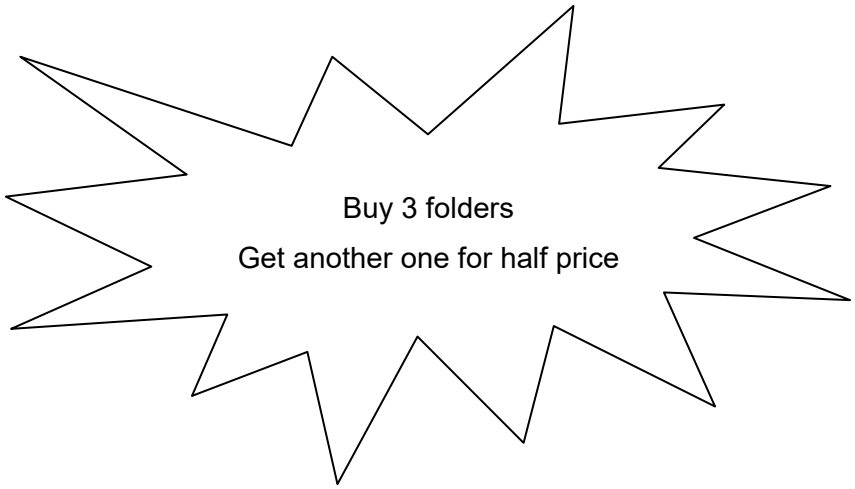
option 3: $2 \times 2.70 = £5.40$

Answer £ £4.94 (1)

Do not write outside the box

11 (c) The shop also sells folders for £3.20 each.

The shop has this offer.



Work out the cost of 4 folders using the offer.

[3 marks]

$3 \times 3.20 + \frac{1}{2} \times 3.20$ (1) (1)

$= 9.60 + 1.60$

$= 11.20$ (1)

Answer £ 11.20

8

Turn over ►

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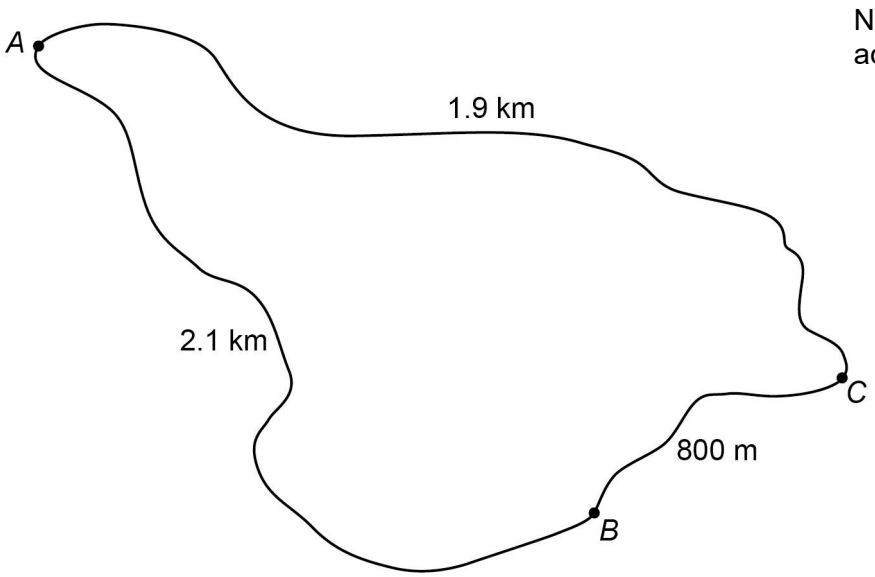
12 (a) *A*, *B* and *C* are connected by paths.

The length of each path is shown.



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Nathan and Sue each walk from *A* to *B*.

Nathan walks along the path $A \rightarrow B$

Sue walks along the paths $A \rightarrow C \rightarrow B$

How much **further** does Sue walk than Nathan?

Give your answer in kilometres.

[3 marks]

Sue : 1·9 + 0·8 = 2·7 km (1)

Nathan : 2·1 km

2·7 − 2·1 = 0·6 km (1)

Answer 0·6 (1) km

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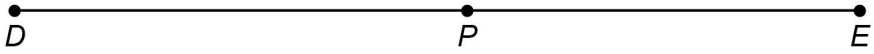
12 (b) A straight path between D and E passes through P.

$DE = 200$ metres

P is 60 metres **closer** to E than to D.

Not drawn accurately



Work out the ratio $DP : PE$

Give your answer in its simplest form.

[3 marks]

$PE = \frac{200 - 60}{2} = 70$ (1)

$DP = 200 - 70 = 130$

(1)

$DP : PE = 130 : 70$

$= 13 : 7$ (1)

Answer 13 : 7

13 Emma tries to simplify $cd \times 2$

Here is her method.

$$c \times 2 = 2c$$
$$d \times 2 = 2d$$
$$2c \times 2d = 4cd$$

What is wrong with her method?

[1 mark]

She has multiplied by 2 twice (1)

7

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14 Work out 0.37×0.26

Give your answer as a decimal.

[4 marks]

$37 \times 10^{-2} \times 26 \times 10^{-2}$ (1)

$(37 \times 26) \times 10^{-4}$ (1)

$37 \times 26 = 962$ (1)

$962 \div 10000 = 0.0962$ (1)

Answer 0.0962

Do not write outside the box

15 (a) Solve $11x - 3 = 6x + 1$

[3 marks]

$11x - 6x = 1 + 3$ (1)

$5x = 4$ (1)

$x = \frac{4}{5} = 0.8$ (1)

$x =$ 0.8

15 (b) Solve $\frac{2x}{5} = 14$

[2 marks]

$2x = 14 \times 5$

$2x = 70$ (1)

$x = 35$ (1)

$x =$ 35

9

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16 Bag A and bag B each contain only red discs and green discs.

Bag A	Contains 28 red discs There are twice as many red discs as green discs
Bag B	Contains 20 green discs There are 3 red discs for every 5 green discs

16 (a) Work out the **total** number of discs.

[3 marks]

Bag A : Red = 28

Green = $\frac{28}{2}$ = 14 (1)

Bag B : Red = $\frac{20}{5} \times 3 = 12$ (1)

Green = 20

Total : 28 + 14 + 12 + 20 = 74 (1)

Answer 74

Do not write outside the box

16 (b) A different bag, C, is empty.

The 28 red discs from A are put into C.

The 20 green discs from B are also put into C.

One disc is now picked at random from each bag.

Complete each statement.

[3 marks]

The probability of red from A is 0 (1)

The probability of red from B is 1 (1)

The probability of red from C is $\frac{28}{48}$ (1)

17 What is $\frac{1}{20}$ as a decimal?

Circle your answer.

[1 mark]

0.2 **0.05** (1) 0.02 0.005

7

Turn over ►

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18 Divide 62 in the ratio 3 : 7

[3 marks]

Total ratio = 3 + 7 = 10 (1)

62 ÷ 10 = 6.2

6.2 × 3 = 18.6 , 6.2 × 7 = 43.4

(1)

(1)

Answer 18.6 and 43.4

19 n is an odd number.

Why is $n(n+1)$ always an even number?

[2 marks]

(n+1) is an even number . odd x even is always an even

(1) number. (1)

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20 Here is some information about the time spent on social media by 40 women and 40 men last week.

Time spent, t (hours)	Number of women	Number of men
$2 < t \leqslant 5$	12	10
$5 < t \leqslant 8$	11	17
$8 < t \leqslant 11$	14	9
$11 < t \leqslant 14$	2	4
$14 < t \leqslant 17$	1	0

Tick **one** box for each statement.

[3 marks]

	Definitely true	Might be true	Cannot be true
Three of the **women** spent more than 11 hours on social media.	✓ (1)		
The range for the **men** is 15 hours.			✓ (1)
The women have a higher median than the men.		✓ (1)	

Turn over for the next question

8

Turn over ►

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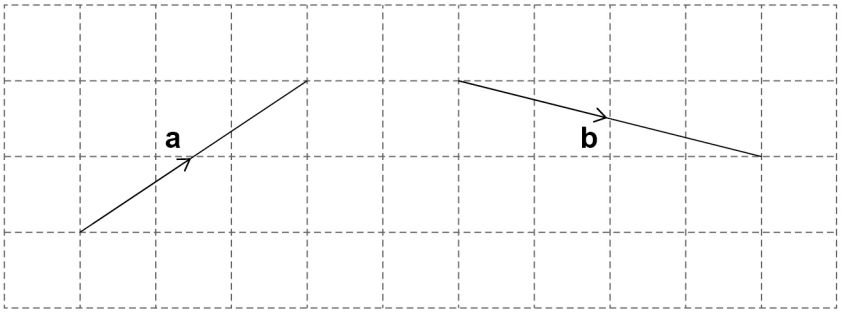
21 The diagram shows the vectors **a** and **b**.

As a column vector $\mathbf{a} = \begin{pmatrix} 3 \\ 2 \end{pmatrix}$



21 (a) What is **b** as a column vector?

[2 marks]

Answer $\begin{pmatrix} 4 \\ -1 \end{pmatrix}$ (1)

21 (b) Work out 4**a** as a column vector.

[1 mark]

$4 \times 3 = 12$
$4 \times 2 = 8$

Answer $\begin{pmatrix} 12 \\ 8 \end{pmatrix}$ (1)

21 (c) $\mathbf{a} + \mathbf{c} = \begin{pmatrix} 3 \\ 0 \end{pmatrix}$

Work out **c** as a column vector.

Circle your answer.

[1 mark]

$\begin{bmatrix} 3 \\ 2 \end{bmatrix} + c = \begin{bmatrix} 3 \\ 0 \end{bmatrix}$

$c = \begin{bmatrix} 3-3 \\ 0-2 \end{bmatrix} = \begin{bmatrix} 0 \\ -2 \end{bmatrix}$

$\begin{pmatrix} 2 \\ 0 \end{pmatrix}$ $\begin{pmatrix} 0 \\ 2 \end{pmatrix}$ $\begin{pmatrix} -2 \\ 0 \end{pmatrix}$ $\begin{pmatrix} 0 \\ -2 \end{pmatrix}$ (1)

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22 Work out $\left(\frac{7}{10} - \frac{4}{15}\right) \div \frac{2}{3}$

Give your answer as a fraction.

[3 marks]

$\left[\frac{21}{30} - \frac{8}{30}\right] = \frac{13}{30}$ (1)

$\frac{13}{30} \times \frac{31}{2} = \frac{13}{20}$ (1)

(1)

Answer $\frac{13}{20}$

23 Work out all the **integer** values of x for which $12 \leqslant 4x < 25$

[2 marks]

$12 \leqslant 4x$ $\quad$ $4x < 25$

$3 \leqslant x$ (1) $\quad$ $x < \frac{25}{4}$

$3 \leqslant x < 6.25$

$3, 4, 5, 6$ (1)

Answer 3 4 5 6

9

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24 Here is some information about 120 people who visit a shop.

$\frac{3}{4}$ of the people buy neither a coat nor a dress.

19 people buy a coat.

14 people buy a dress.

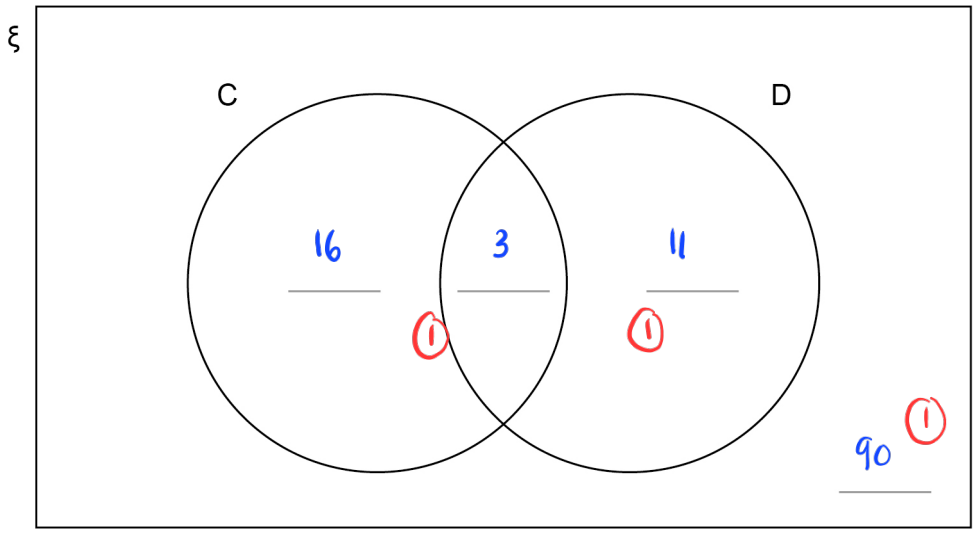
Complete this Venn diagram to represent the information.

[3 marks]

ξ = 120 people who visit the shop

C = people who buy a coat

D = people who buy a dress



$\frac{3}{4} \times 120 = 90$

$120 - 90 = 30$

$19 + 14 = 33$

$33 - 30 = 3$

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25 Write $(3^6 \times 3^5) : 3^7$ in the form $n : 1$ where n is an integer.

[3 marks]

$3^{6+5} : 3^7$

$= 3^{11} : 3^7$ (1)

$3^4 : 1$ (1)

$= 81 : 1$ (1)

Answer 81 : 1

26 a is 10% more than b.

Circle the ratio $a : b$

[1 mark]

10 : 11 10 : 1 **11 : 10** (1) 1 : 10

Turn over for the next question

7

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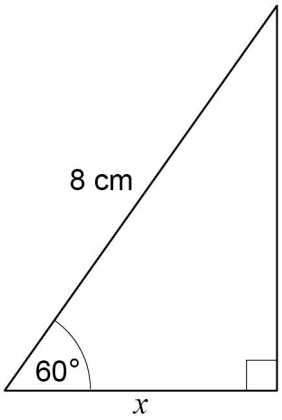
27 Use trigonometry to work out the value of x.



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[3 marks]

$\cos 60^\circ = \frac{x}{8}$ (1)

$x = 8 \cos 60^\circ$ (1)

$= 8\left(\frac{1}{2}\right)$

$= 4$ (1)

$x =$ 4 cm

END OF QUESTIONS

3

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