

Please write clearly in block capitals.

Centre number

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Candidate number

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Surname

Forename(s)

Candidate signature

I declare this is my own work.

GCSE MATHEMATICS

Example-Problem Past Paper

F

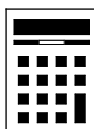
Foundation Tier Paper 3 Calculator

June 2023

Materials

For this paper you must have:

- a calculator
- mathematical instruments.



First Half

Instructions

- Engage with the fully-worked solutions in full before attempting the shadow questions.
- Explain the fully-worked solutions to yourself, anticipating the next steps in the worked solutions, making links between the problems and the mathematics used to solve them.
- Apply the methods learnt from the fully-worked solutions to the shadow questions, writing down all workings in the spaces provided. Your thought process is important.
- Do all rough work in this book.

Information

- The marks for questions are shown in brackets.
- You may ask for more answer paper, graph paper and tracing paper.
- You should ask your teacher for help on a question if you don't understand a part of the fully-worked solution. Remember to be specific, understanding why the step was completed, rather than simply getting the correct answer.

Advice

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

Where a calculator has been used, show clearly what you entered into the calculator.

Answer **all** questions in the spaces provided.1 (a) Solve $5x = 15$

[1 mark]

$$\begin{array}{r} 5x = 15 \\ \div 5 \quad \div 5 \\ \hline x = 3 \end{array}$$

$$x = 3$$

1 (b) Solve $y + 7 = 50$

[1 mark]

$$\begin{array}{r} y + 7 = 50 \\ - 7 \quad - 7 \\ \hline y = 43 \end{array}$$

$$y = 43$$

1 (c) Solve $\frac{c}{4} = 8$

[1 mark]

$$\begin{array}{r} \underline{c} = 8 \\ 4 \quad \times 4 \\ \hline c = 32 \end{array}$$

$$c = 32$$

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

Do not write
outside the
box

1 (a) Solve $6y = 42$

[1 mark]

$y =$ _____

1 (b) Solve $h + 8 = 35$

[1 mark]

$h =$ _____

1 (c) Solve $\frac{a}{7} = 9$

[1 mark]

$a =$ _____

Turn over ►

2 Here is a list of numbers.

10 8 2 11 12 15 4 4
2 4 4 8 10 11 12 15

2 (a) Write down the mode.

[1 mark]

most common

Answer 4

2 (b) Work out the median.

[2 marks]

middle number 2 4 4 8 10 11 12 15

$$\frac{8+10}{2} : \frac{18}{2} : 9$$

Answer 9

2 (c) Work out the range.

largest - smallest

[1 mark]

$$15 - 2 : 13$$

Answer 13

2 Here is a list of numbers.

20 18 13 1 13 7 2 5

2 (a) Write down the mode.

[1 mark]

Answer _____

2 (b) Work out the median.

[2 marks]

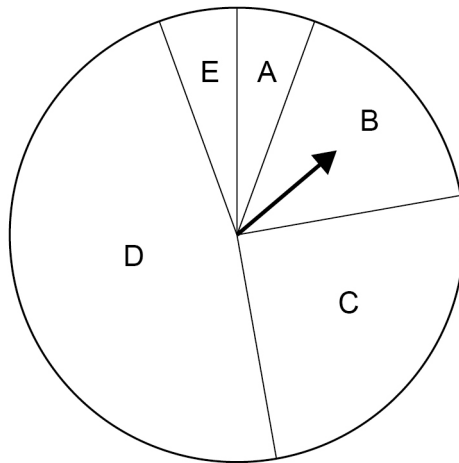
Answer _____

2 (c) Work out the range.

[1 mark]

Answer _____

- 3 (a) A fair spinner with five sections is spun.



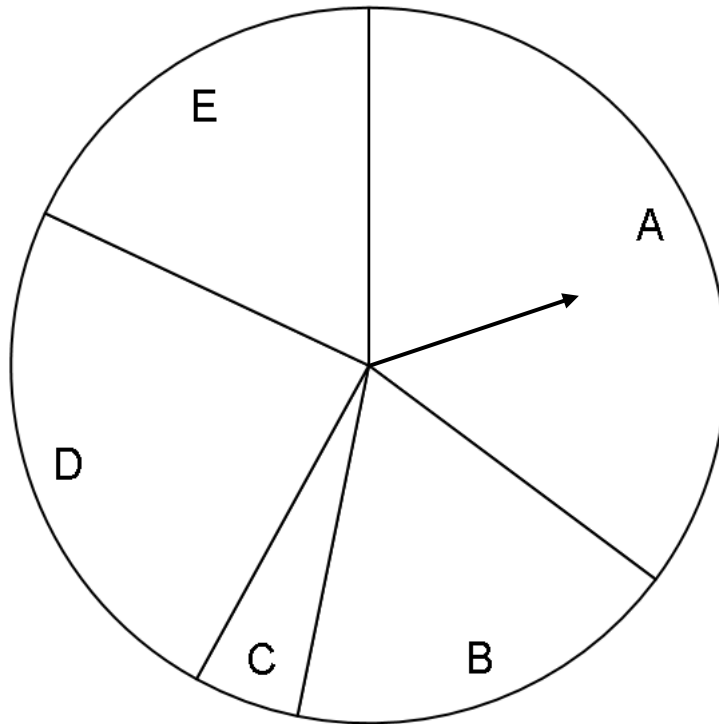
Complete these statements.

[2 marks]

The spinner is **most likely** to land on section D

The spinner is **equally likely** to land on sections A and E

- 3 (a) A fair spinner with five sections is spun.



Complete these statements.

[2 marks]

The spinner is **least likely** to land on section _____

The spinner is **equally likely** to land on sections _____ and _____

3 (b) Two different spinners are spun.

One spinner has sections labelled with colours.

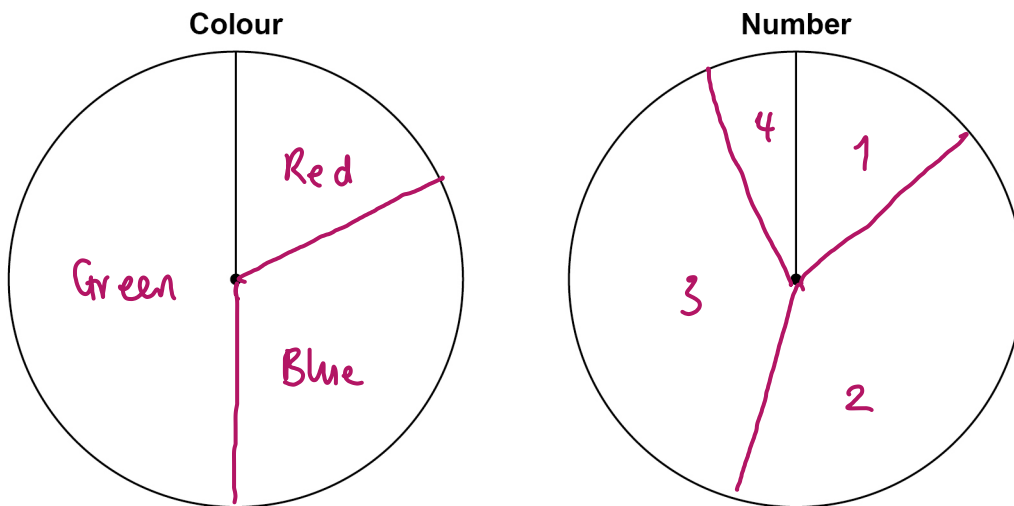
The other spinner has sections labelled with numbers.

Here is a list of **all** the possible outcomes.

Red 1	Red 2	Red 3	Red 4
Blue 1	Blue 2	Blue 3	Blue 4
Green 1	Green 2	Green 3	Green 4

Show the possible sections on the two spinners.

[2 marks]



3 (b) Two different spinners are spun.

One spinner has sections labelled with colours.

The other spinner has sections labelled with shapes.

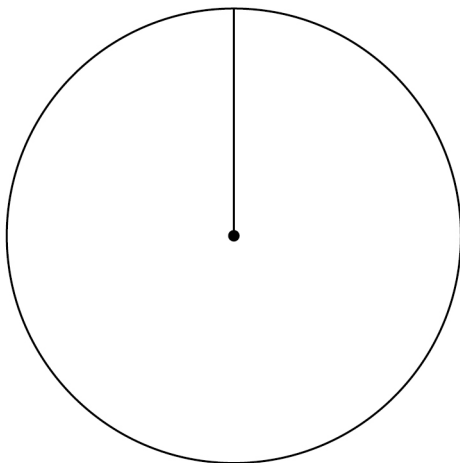
Here is a list of **all** the possible outcomes.

Red Square	Blue Square	Green Square	Yellow Square
Red Circle	Blue Circle	Green Circle	Yellow Circle
Red Triangle	Blue Triangle	Green Triangle	Yellow Triangle

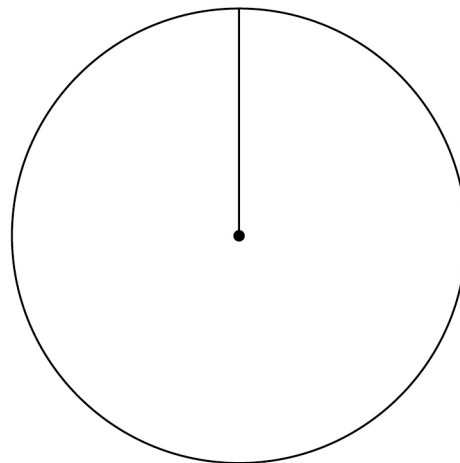
Show the possible sections on the two spinners.

[2 marks]

Colour



Shape



- 4 A reel holds 9.5 metres of ribbon.
2 pieces of ribbon are cut from the reel.
Each piece is 20 centimetres long.
What length of ribbon is left on the reel?
State the units of your answer.

[3 marks]

$$20\text{cm} \times 2 = 40\text{cm}$$

$$9.5\text{m} = 950\text{cm}$$

$$950\text{cm} - 40\text{cm} = 910\text{cm}$$

Answer 910cm

- 4** A roll holds 10.5 metres of wallpaper.
3 pieces of wallpaper are cut from the roll.
Each piece is 80 centimetres long.
What length of wallpaper is left on the roll?
State the units of your answer.

[3 marks]

Answer _____

- 5 (a) The term-to-term rule for a sequence is

subtract 1 then multiply by 5

The 1st term is 4

Work out the 3rd term.

[2 marks]

$$(4 - 1) \times 5 = 3 \times 5 = 15$$

$$(15 - 1) \times 5 = 14 \times 5 = 70$$

Answer 70

- 5 (b) The term-to-term rule for a different sequence is

add 20 then divide by 2

The 2nd term is 50

Work out the 1st term.

[2 marks]



$$50 \times 2 = 100 \quad 100 - 20 = 80$$

Answer 80

- 5 (a)** The term-to-term rule for a sequence is

add 3 then multiply by 4

The 1st term is 1

Work out the 3rd term.

[2 marks]

Answer _____

- 5 (b)** The term-to-term rule for a different sequence is

subtract 45 then divide by 5

The 2nd term is 30

Work out the 1st term.

[2 marks]

Answer _____

- 6** Scarlett leaves home at 10.00 to cycle to the supermarket.
Here is part of a distance-time graph of her trip to the supermarket.



- 6 (a)** She arrives at the supermarket at 10.20
How far is the supermarket from her home?

[1 mark]

Answer 7 km

- 6 (b)** She leaves the supermarket at 10.35
How long does she stay at the supermarket?

[1 mark]

Answer 15 minutes

- 6 (c) Scarlett cycles home at a constant speed using the same route.
It takes her 3 minutes longer than her journey to the supermarket.

Complete the distance-time graph.

[2 marks]

20 minutes + 3 minutes : 23 minutes

10:35 + 23m : 10:58

- 7 This week, Liam works
25 hours at £10.20 per hour
and
extra hours at the weekend at £11.80 per hour.

Here are the extra hours he works at the weekend.

Saturday	7 am to 10 am
Sunday	1 pm to 3 pm

3 hrs } 5 hours
2 hrs }

In **total**, how much is he paid this week?

[4 marks]

25 × £10.20 = £255

5 × £11.80 = £59

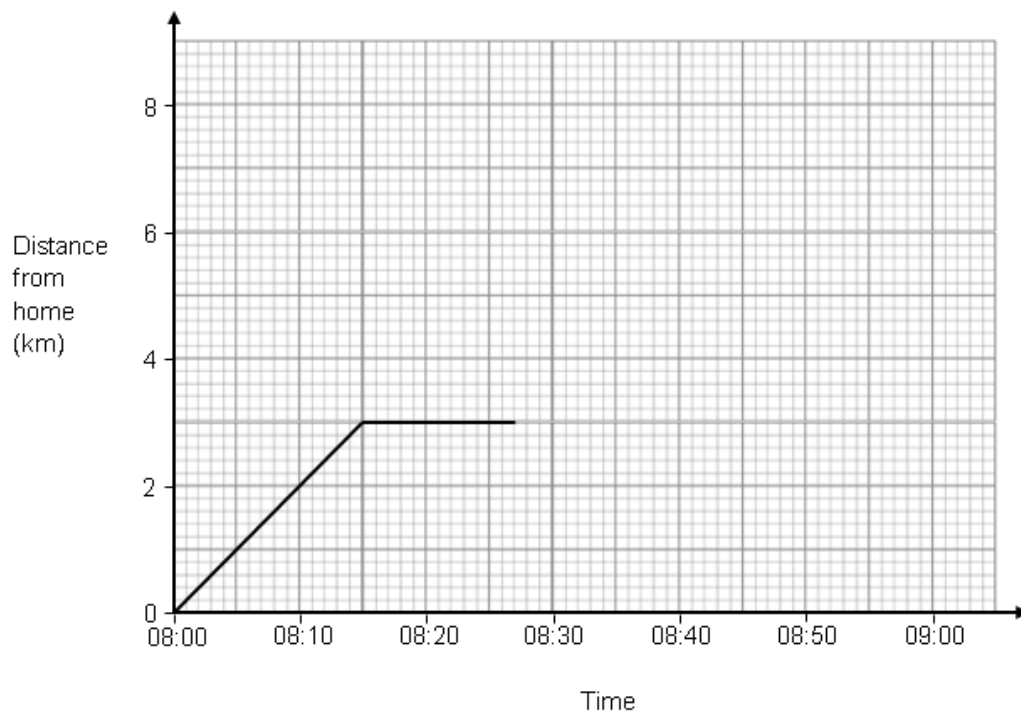
£255 + £59 = £314

Answer £

314

Turn over ►

- 6** Ronnie leaves home at 08.00 to cycle to a friend's house.
Here is part of a distance-time graph of his trip.



- 6 (a)** He arrives at the friend's house at 8:15
How far is Ronnie's friend's house from his home?

[1 mark]

Answer _____ km

- 6 (b)** Ronnie leaves his friend's house at 8.27
How long does he stay at his friend's?

[1 mark]

Answer _____ minutes

- 6 (c)** Ronnie cycles home at a constant speed using the same route.
It takes him 6 minutes longer than his journey to his friend's house.
Complete the distance-time graph.

[2 marks]

- 7** This week, Anisha works
24 hours at £10.40 per hour
and
extra hours at the weekend at £15.60 per hour.

Here are the extra hours she works at the weekend.

Saturday	6 am to 10 am
Sunday	2 pm to 8 pm

In **total**, how much is she paid this week?

[4 marks]

Answer £ _____

- 8 Three oranges have masses of 60 g, 70 g and 85 g

Show that their **total** mass is between $\frac{1}{5}$ and $\frac{1}{4}$ of a kilogram.

[3 marks]

$$1 \text{ kg} = 1000 \text{ g}$$

$$\frac{1}{5} \text{ of } 1 \text{ kg} = 1000 \text{ g} \div 5 = 200 \text{ g}$$

$$\frac{1}{4} \text{ of } 1 \text{ kg} = 1000 \text{ g} \div 4 = 250 \text{ g}$$

$$60 \text{ g} + 70 \text{ g} + 85 \text{ g} = 215 \text{ g}$$

$$200 \text{ g} < 215 \text{ g} < 250 \text{ g}$$

- 9 For each statement, tick the correct box.

[3 marks]

	Always true	Sometimes true	Never true
One of the three angles of a triangle is 90°	☐	☒	☐
One of the three angles of a triangle is obtuse	☐	☒	☐
One of the three angles of a triangle is reflex (more than 180°)	☐	☐	☒

- 8 Three plums have masses of 40 g, 40 g and 35 g

Show that their **total** mass is between $\frac{1}{10}$ and $\frac{1}{8}$ of a kilogram.

[3 marks]

- 9 For each statement, tick the correct box.

[3 marks]

	Always true	Sometimes true	Never true
At least one of the three angles in a triangle has to be acute.	☐	☐	☐
All three angles in a triangle are the same size.	☐	☐	☐
One of the three angles of a triangle is obtuse.	☐	☐	☐

10 (a) Simplify fully $p^2 \times p$

[1 mark]

$$p \times p \times p = p^3$$

Answer p^3

10 (b) Simplify fully $3a + 5c - a + 6c$

[2 marks]

$$3a - a + 5c + 6c$$

$$2a + 11c$$

Answer $2a + 11c$

10 (a) Simplify fully $m^5 \times m^3$

[1 mark]

Answer _____

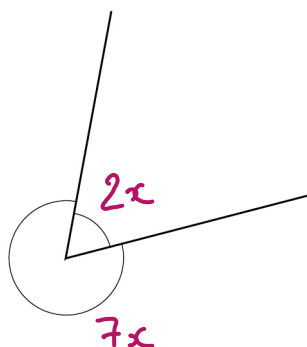
10 (b) Simplify fully $8h + 9g - 2h + 5g$

[2 marks]

Answer _____

11

Two angles around a point are shown.

Not drawn
accurately

The angles are in the ratio 2 : 7

Show that the larger angle is 280° **[2 marks]**

$$2x + 7x = 360$$

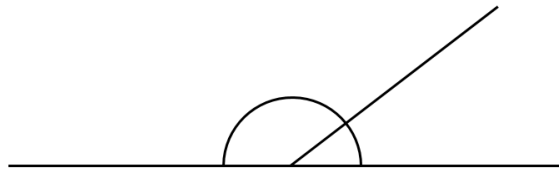
$$9x = 360$$

$$\div 9 \quad \div 9$$

$$x = 40$$

$$7x = 7 \times 40 = 280^\circ$$

- 11 Two angles on a straight line are shown.



Not drawn
accurately

The angles are in the ratio 4 : 11

Show that the smaller angle is 48°

[2 marks]

12 (a) $c > 4$ $d < 4$ $c - d = 6$

Work out a possible pair of values for c and d .

[2 marks]

c	5	6	7	8	9	10	11
d	4	3	2	1	0		

$c = 6$ $d = 0$

12 (b) w is greater than 1 **and** less than 2
 x is greater than 0 **and** less than 1

$w + x = 2.6$

Work out a possible pair of values for w and x .

[2 marks]

w	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9
x	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9

$w = 1.8$ $x = 0.8$

12 (a) $a > 7$ $b < 3$ $a - b = 10$

Work out a possible pair of values for a and b .

[2 marks]

$$a = \underline{\hspace{2cm}} \quad b = \underline{\hspace{2cm}}$$

12 (b) w is greater than 4 **and** less than 5
 x is greater than 1 **and** less than 2

$w + x = 6.5$

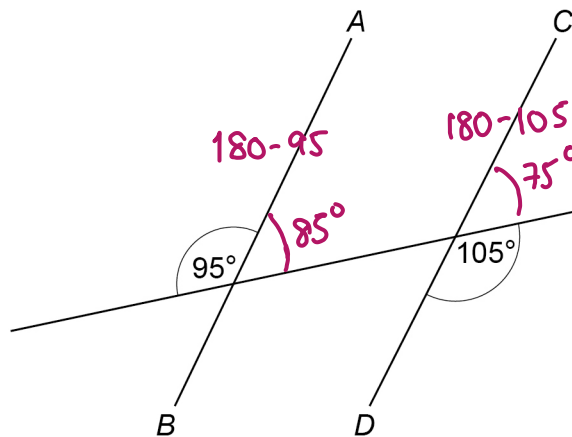
Work out a possible pair of values for w and x .

[2 marks]

$$w = \underline{\hspace{2cm}} \quad x = \underline{\hspace{2cm}}$$

13

Here are three straight lines.

Not drawn
accuratelyAre the lines AB and CD parallel?

Tick a box.

Yes

☐

No

☒

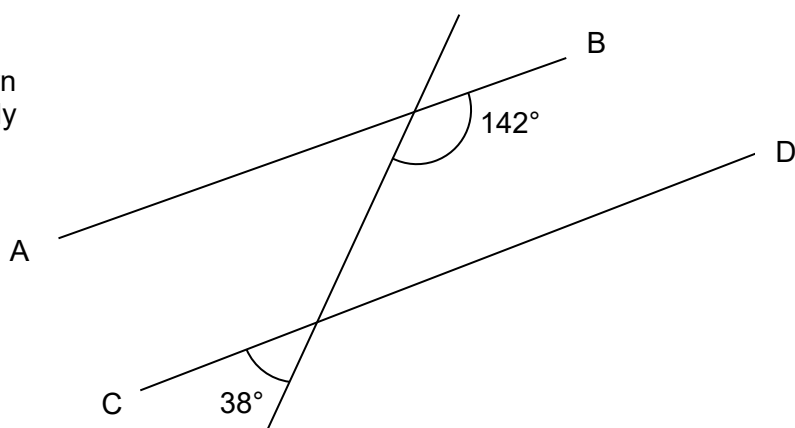
Show working to support your answer.

[2 marks]

85° and 75° angles are corresponding angles, but not equal, so AB and CD are not parallel.

13

Here are three straight lines.

Do not write
outside the
boxNot drawn
accuratelyAre the lines AB and CD parallel?

Tick a box.

Yes

☐

No

☐

Show working to support your answer.

[2 marks]

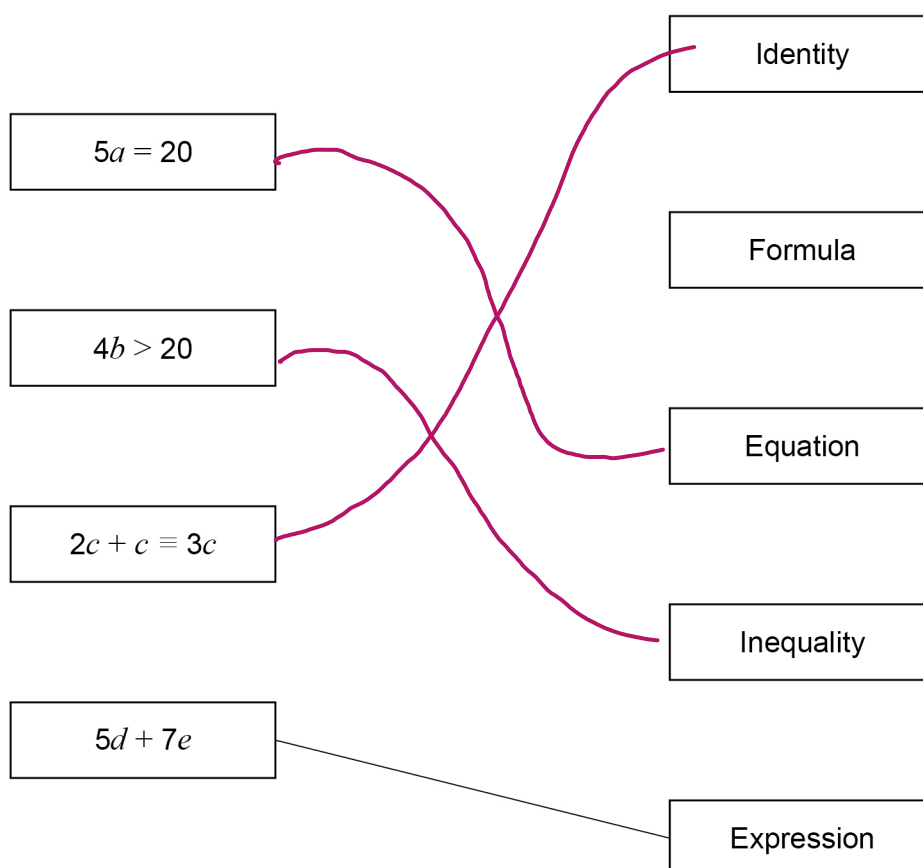
Turn over ►

14

Match the algebra to the correct description.

One has been done for you.

[3 marks]



14

Match the algebra to the correct description.

One has been done for you.

[3 marks]

$$4(a + 3) \equiv 4a + 12$$

Identity

$$3b - 6a$$

Formula

$$5x + 7 = 22$$

Equation

$$A = 2r + 6d$$

Inequality

Expression

Turn over ►

15

Popcorn is sold in bags.

8 small bags have a total mass of 496 g

5 small bags and 2 large bags have a total mass of 638 g

Work out the mass of a large bag.

[4 marks]

$$\begin{array}{r|l}
 8 \text{ small} & 496 \text{ g} \\
 \hline
 1 \text{ small} & 62 \text{ g} \\
 \hline
 5 \text{ small} & 310 \text{ g}
 \end{array}$$

$$\begin{array}{r}
 638 \text{ g} \\
 - 310 \text{ g} \\
 \hline
 328 \text{ g}
 \end{array}$$

(2 large bags)

$$328 \div 2 = 164$$

Answer 164 g

Potatoes are sold in bags.

2 large bags have a total mass of 650 g

4 small bags and 3 large bags have a total mass of 1975 g

Work out the mass of a small bag.

[4 marks]

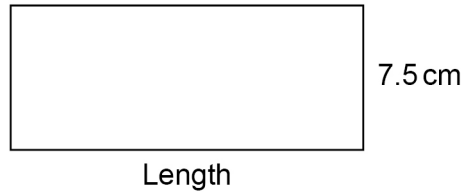
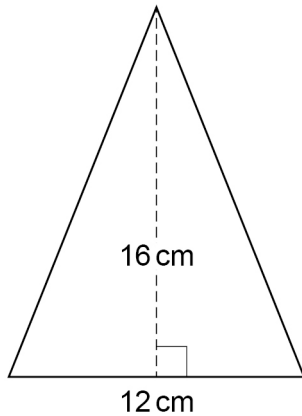
Answer _____ g

4

Turn over ►

16

The rectangle and the triangle have the same area.

Not drawn
accurately

Work out the length of the rectangle.

[3 marks]

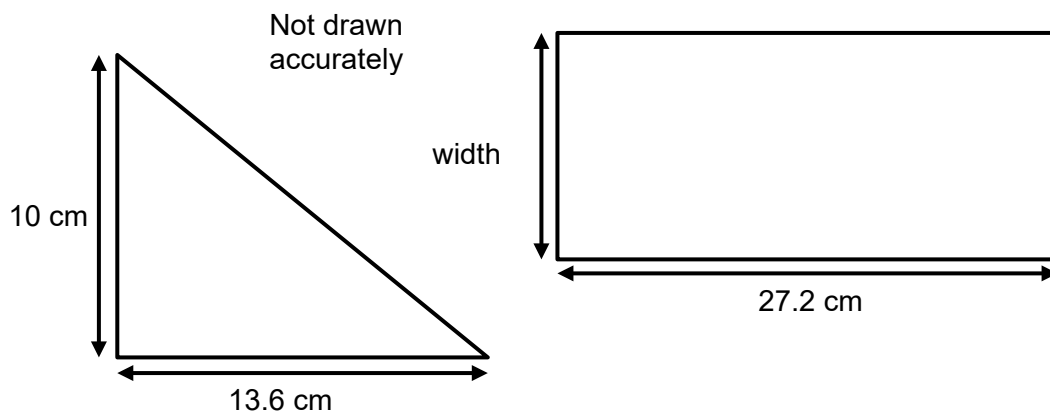
$$\text{Area of triangle} = \frac{12 \times 16}{2} = 96 \text{ cm}^2$$

$$\frac{96}{7.5} = 12.8$$

Answer 12.8 cm

16

The square and the triangle have the same area.



Work out the width of the rectangle.

[3 marks]

Answer _____ cm

[illegible]

[illegible]

[illegible]