

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Write 16 734 correct to the nearest thousand.

16000 17000
 ↑
 16734

17000

(Total for Question 1 is 1 mark)

2 Write 0.9 as a fraction.

remember $0.1 = \frac{1}{10}$
so $0.9 = \frac{9}{10}$

$\frac{9}{10}$

(Total for Question 2 is 1 mark)

3 Change 950 centimetres into metres.

$100\text{cm} = 1\text{m}$
 $950\text{cm} = 9.5\text{m}$

9.5

metres

(Total for Question 3 is 1 mark)

4 Simplify $7 \times 2g$

$7 \times 2 = 14$

14g

(Total for Question 4 is 1 mark)

5 Here is a list of numbers.

60 75 90 120 150

One of these numbers is a multiple of 45

Which number?

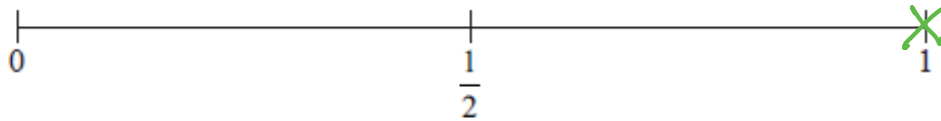
45, 90 ✓
x

90

(Total for Question 5 is 1 mark)

6 Susan has a fair ordinary dice.
She rolls the dice once.

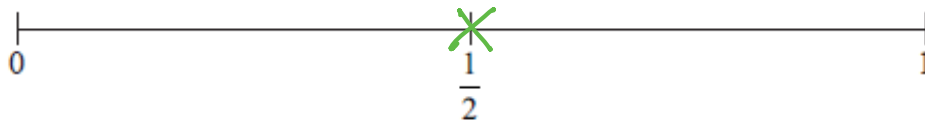
(a) On the probability scale, mark with a cross (×) the probability that Shari gets a number between less than 7.



(1)

(b) On the probability scale, mark with a cross (×) the probability that Susan gets an odd number.

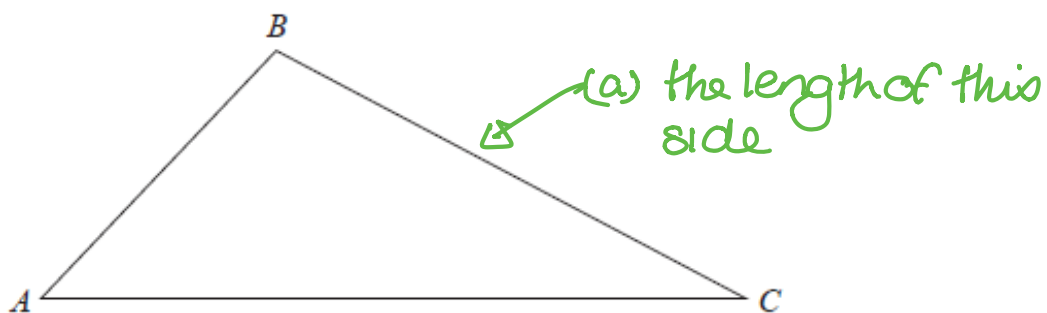
1, 3, 5 so $\frac{3}{6}$ $\frac{3}{6} = \frac{1}{2}$



(1)

(Total for Question 6 is 2 marks)

7 Here is a triangle.



(a) Measure the length of BC .

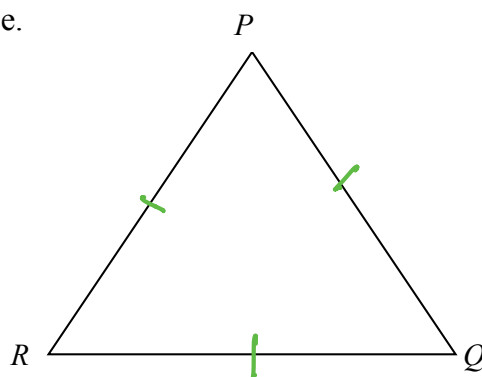
(This may depend on your printer settings!)

..... 6.8 cm
(6.6 to 6.9 allowed) (1)

(b) Measure the size of angle A .

..... 47 °
(45 to 49 allowed) (1)

Here is a different triangle.



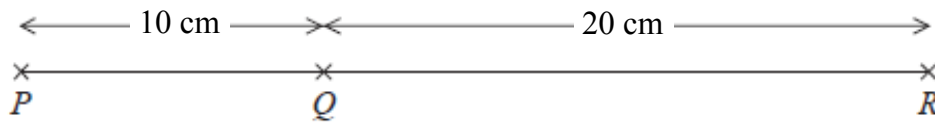
$$QP = QR = PR$$

(c) Write down the mathematical name of this triangle.

..... equilateral (triangle) (1)

(Total for Question 7 is 3 marks)

8 The diagram shows three motorway service stations P , Q and R on a map.



The map has a scale of $1 \text{ cm} = 6 \text{ km}$.

Work out the real distance from P to R .

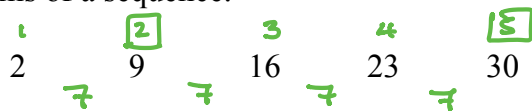
Total length P to $R = 30 \text{ cm}$

$1 \text{ cm} = 6 \text{ km}$
 $\times 30 \rightarrow 30 \text{ cm} = 180 \text{ km}$

..... 180 km

(Total for Question 8 is 3 marks)

9 Here are the first five terms of a sequence.



(a) Write down the next term of this sequence.

$30 + 7$

..... 37

(1)

(b) Write down the ratio of the second term to the fifth term.
 Give your ratio in its simplest form.

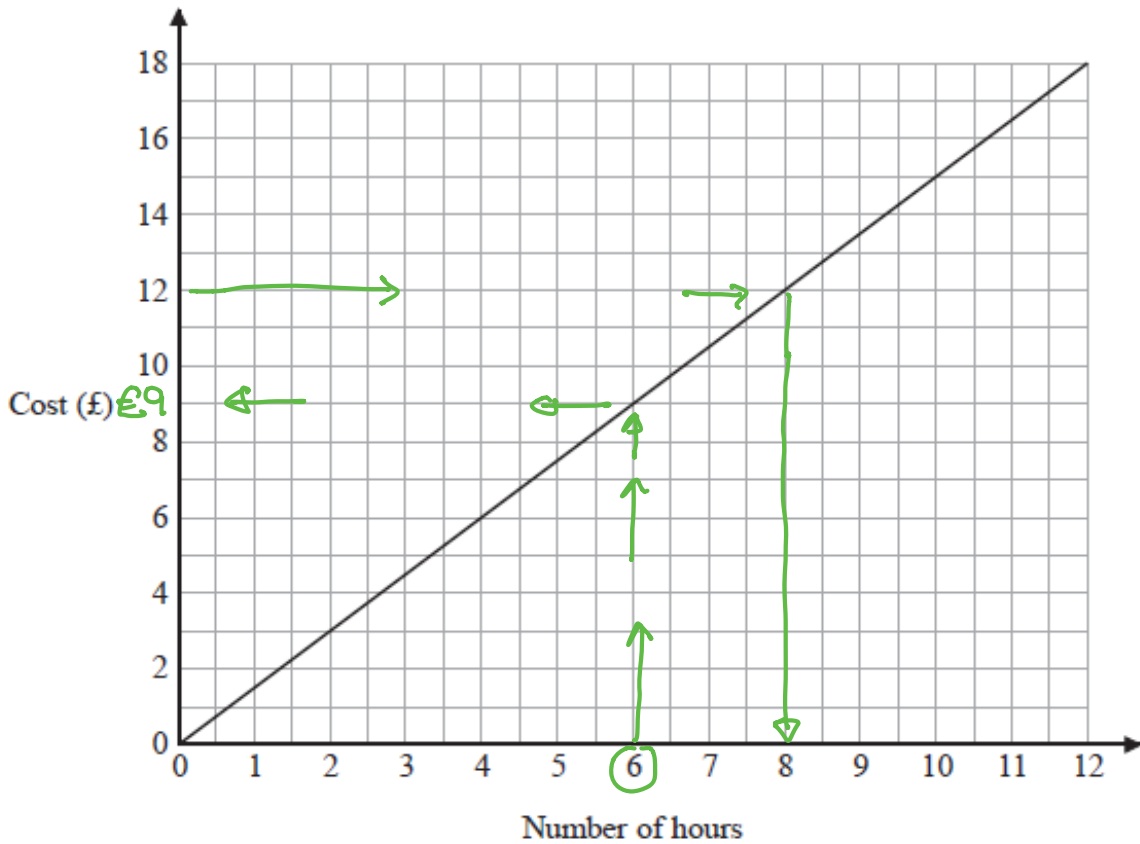
$9 : 30$
 $\div 3 \quad \div 3$
 $3 : 10$

..... $3 : 10$

(2)

(Total for Question 9 is 3 marks)

10 This graph can be used to find the cost of hiring a boat on a lake for up to 12 hours.



(a) Use the graph to find the cost of hiring a boat for 6 hours.

£ 9 (1)

Michael hires a boat at 09 00 in the morning.
When he returns the boat he has to pay £12

(b) At what time does Michael return the boat?

£12 = 8 hours
so 09 → 10 → 11 → 12 → 5pm

..... 5pm (17 00) (3)

(Total for Question 10 is 4 marks)

11 The table shows information about the weights of the people in a gymnasium.

Weight	Number of people
40 kg	2
50 kg	3
60 kg	5
70 kg	6
80 kg	4
90 kg	2

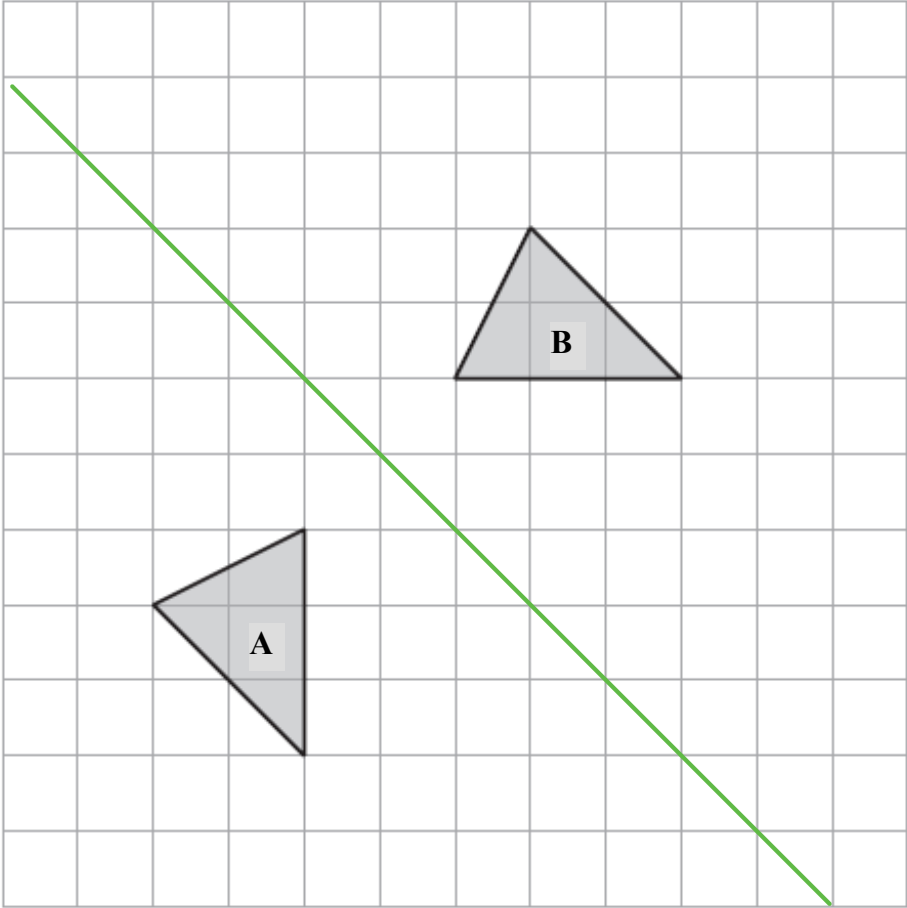
Show that the total weight of the people in the gymnasium is more than 1500 kg.

$$\begin{array}{r} 40 \times 2 = 80 \\ 50 \times 3 = 150 \\ 60 \times 5 = 300 \\ 70 \times 6 = 420 \\ 80 \times 4 = 320 \\ 90 \times 2 = 180 \\ \hline \text{Total} \quad 1450 \end{array}$$

$$1450 \text{ kg} < 1500 \text{ kg}$$

(Total for Question 11 is 3 marks)

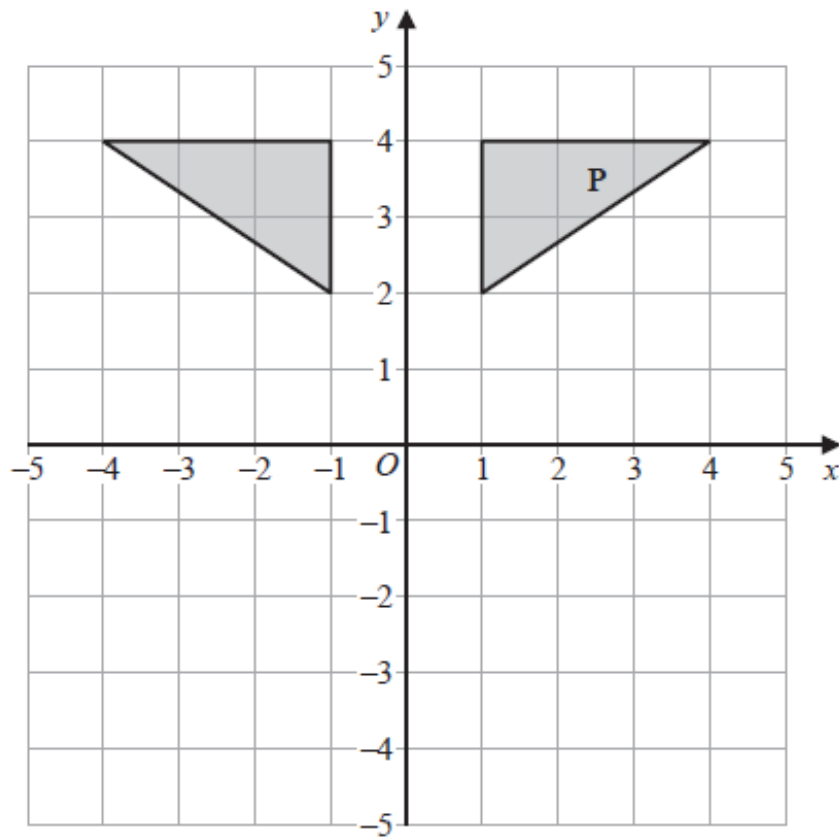
12 Shape A is reflected in a mirror line to give shape B.



(a) On the grid, draw the mirror line.

(1)

(b) Andrew is asked to reflect shape **P** in the x -axis.
Here is the diagram Andrew draws.



Explain the mistake Andrew has made.

..... he has reflected in the y axis. (not the x axis)

.....

(1)

(Total for Question 12 is 2 marks)

- 13 There are 65 doctors in a hospital.
This is $\frac{1}{15}$ of the total number of people in the hospital.

Work out the total number of people in the hospital.

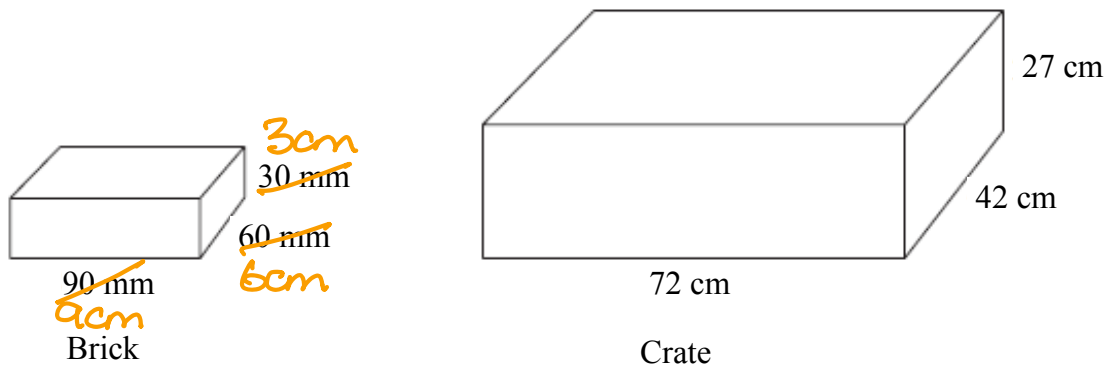
$$65 \text{ doctors} = \frac{1}{15}$$

$$\text{so } \frac{15}{15} = 65 \times 15 \\ = 975$$

975

.....
(Total for Question 13 is 2 marks)

14 Bricks are put into crates.



Each brick is a cuboid, 90 mm by 60 mm by 30 mm.
Each crate is a cuboid, 72 cm by 42 cm by 27 cm.

Work out the greatest number of bricks that can be put into each crate.

$$\begin{aligned} \text{Brick Volume} &= 3 \times 6 \times 9 \\ &= 162 \text{ cm}^3 \end{aligned}$$

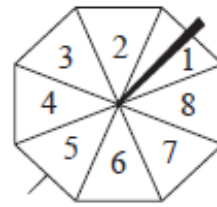
$$\begin{aligned} \text{Crate Volume} &= 27 \times 42 \times 72 \\ &= 81648 \text{ cm}^3 \end{aligned}$$

$$\text{Greatest number} = \frac{81648}{162} = 504$$

504

(Total for Question 14 is 4 marks)

15 Here is a fair ordinary dice and a fair 8-sided spinner.



Sammy throws the dice once and spins the spinner once.

Is Sammy more likely to get

a number less than 5 on the dice $1, 2, 3, 4$
or a number greater than 3 on the spinner? $4, 5, 6, 7, 8$

You must show all your working.

<u>Dice</u>	<u>Spinner</u>
$\frac{4}{6}$	$\frac{5}{8}$
$(\times 4)$	$(\times 3)$
$\frac{16}{24}$	$\frac{15}{24}$

More likely to get a number less than 5 on the dice.

$$\frac{16}{24} > \frac{15}{24}$$

(Total for Question 15 is 3 marks)

16 David drives at an average speed of 44 km/h for 2 hours 15 minutes.

Work out the distance David drives.

$$\begin{aligned} 44 \text{ km} &= 1 \text{ hour} \\ \div 4 & \\ 11 \text{ km} &= 15 \text{ mins} \quad \downarrow \div 4 \\ 88 \text{ km} &= 2 \text{ hours} \end{aligned}$$

$$\begin{aligned} \text{so } 2 \text{ hours } 15 \text{ mins} &= 88 + 11 \\ &= 99 \end{aligned}$$

..... 99 km

(Total for Question 16 is 3 marks)

17 There are 4 theatres **A**, **B**, **C** and **D**.

The mean number of seats per theatre is 380

There are 375 seats in theatres **A**.

There are 225 seats in theatres **B**.

There are 470 seats in theatres **C**.

$$\begin{aligned} \text{mean} &= 380 \\ \text{so total} &= 380 \times 4 \\ &= 1520 \end{aligned}$$

Work out the number of seats in theatres **D**.

A	B	C	D
375	225	470	

$375 + 225 + 470 = 1070$

$$\begin{aligned} 1520 - 1070 \\ = 450 \end{aligned}$$

.....
450

(Total for Question 17 is 4 marks)

18 Aston buys 270 chocolate bars.

The chocolate bars are sold in packs.
There are 15 chocolate bars in each pack.
Each pack costs £4

(a) Work out the total cost of the chocolate bars Aston buys.

Packs $270 \div 15 = 18 \text{ packs}$

Cost $18 \times £4 = £72$

£.....72.....
(3)

Ellie buys 36 cartons of juice for £25
There are 350 ml of juice in each carton.

(b) Work out the cost of 200 ml of juice.
Give your answer correct to the nearest penny.

36 cartons = £25
x 350

12600 ml = ~~£25~~ 2500p
÷ 126 ÷ 126

100 ml = 19.84... p
x 2 x 6

200ml = 39.682... p

.....40.....p
(3)

(Total for Question 18 is 6 marks)

19 140 people attend an open air concert.

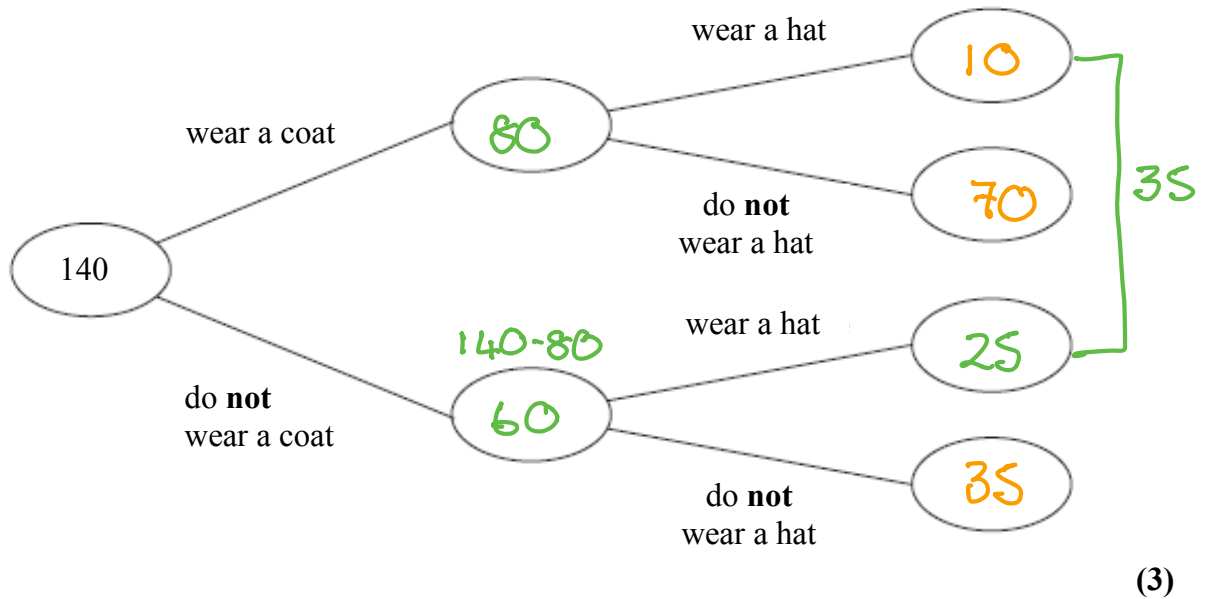
Of these people

80 wear a coat

35 wear a hat

25 of the people who wear a hat do **not** wear a coat.

(a) Use this information to complete the frequency tree.



(b) What percentage of the 80 people who wear a coat do **not** wear a hat?

$$\frac{70}{80} \times 100$$

..... 87.5 %
(2)

(Total for Question 19 is 5 marks)

20 (a) Work out the value of $\frac{\sqrt{1577} - 32}{2.3^2 - 5}$

Write down all the figures on your calculator display.

26.59123898

.....
(2)

(b) Work out the value of the reciprocal of 0.8

$$\frac{1}{0.8}$$

1.25

.....
(1)

(Total for Question 20 is 3 marks)

21 Write 84 as a product of its prime factors.

$$84 = 4 \times 21$$
$$= 2 \times 2 \times 3 \times 7$$

$$2^2 \times 3 \times 7$$

(Total for Question 21 is 2 marks)

22 There are 48 counters in a bag.
There are only blue counters and green counters in the bag.

$$\text{number of blue counters} : \text{number of green counters} = 1 : 3$$

Hermione has to work out how many blue counters are in the bag.

She says,

“There are 16 blue counters in the bag because 1 is a third of 3 and 16 is a third of 48”

Is Hermione correct?

You must give a reason for your answer.

$$48 \div 4 = 12 \quad 12 \times 1 = 12 \quad 12 \times 3 = 36$$

She is not correct. There are 12 blue, a quarter of 48 is 12.

(Total for Question 22 is 1 mark)

23 $-3 < n \leq 7$

n is an integer.

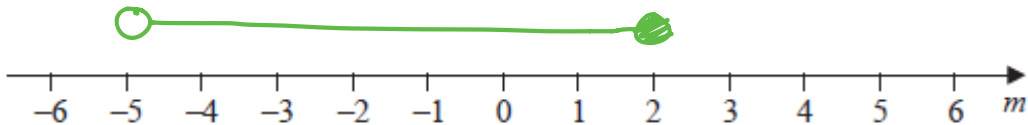
(a) Write down the greatest possible value of n .

~~-3~~, -2, 1, 0, 1, 2, 3, 4, 5, 6, 7 7

greatest value

(1)

(b) On the number line below, show the inequality $-5 < m \leq 2$



(2)

(c) Solve $\frac{4}{5}h - 6 < 10$

$$\frac{4}{5}h - 6 < 10$$
$$\frac{4}{5}h \quad +6 \quad +6$$

$$\frac{4}{5}h < 16$$

$$h < \frac{16 \times 5}{4}$$

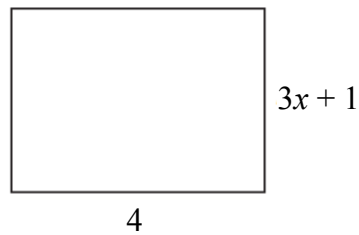
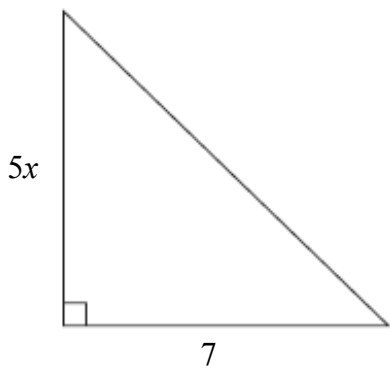
$$h < 20$$

$h < 20$

(3)

(Total for Question 23 is 6 marks)

24 Here is a triangle and a rectangle.



All measurements are in centimetres.

The area of the triangle is 18 cm^2 greater than the area of the rectangle.

Work out the value of x .

$$\begin{aligned} \triangle &= \frac{1}{2} \times 7 \times 5x \\ &= 17.5x \end{aligned}$$

$$\begin{aligned} \square &= 4(3x + 1) \\ &= 12x + 4 \end{aligned}$$

$$17.5x = 12x + 4 + 18$$

$$5.5x = 22$$

$$x = \frac{22}{5.5}$$

$$= 4$$

$$x = \dots\dots\dots 4 \dots\dots\dots$$

(Total for Question 24 is 4 marks)

- 25 Last month a farmer sold 900 kg of vegetables.
65% of these vegetables were turnips and parsnips.

$$\text{weight of turnips} : \text{weight of parsnips} = 9 : 4$$

Calculate the weight of parsnips the farmer sold.

900kg veg.

↙

65% turnips & parsnips

$$0.65 \times 900$$
$$= 585$$

turnips : parsnips

9 : 4

585 ÷ 13 = 45

$$9 \times 45$$
$$= 405$$

$$4 \times 45$$
$$= \underline{180}$$

.....180..... kg
(Total for Question 25 is 3 marks)

- 26 A number, d , is rounded to 2 decimal places.
The result is 2.73

Complete the error interval for d .

$$2.72 \quad \uparrow \quad 2.73 \quad \uparrow \quad 2.74$$
$$\dots 2.725 \leq d < 2.735 \dots$$

(Total for Question 26 is 2 marks)

- 27 Ronnie buys a house with a value of £280 000
The value of Ronnie's house increases by 2.5% each year. 1.025

Tom buys a house with a value of £260 000
The value of Tom's house increases by 6% each year. 1.06

At the end of 2 years, whose house has the greater value?
You must show how you get your answer.

$$\underline{\text{Ronnie}} \quad 280\,000 \times 1.025^2 = \pounds 294\,175$$

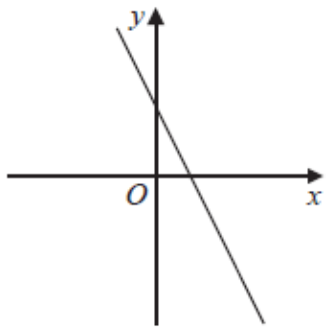
$$\underline{\text{Tom}} \quad 260\,000 \times 1.06^2 = \pounds 292\,136$$

Ronnie's house has the greater value

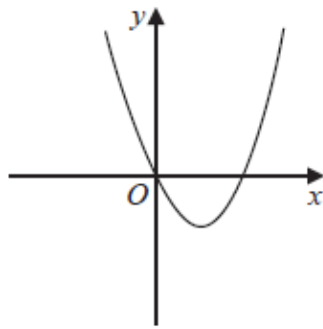
$$294\,175 > 292\,136$$

(Total for Question 27 is 4 marks)

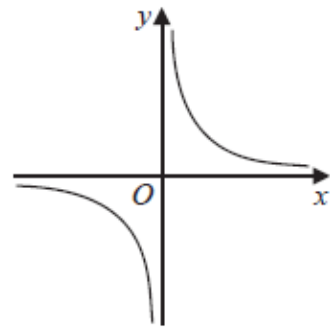
28 Here are five graphs.



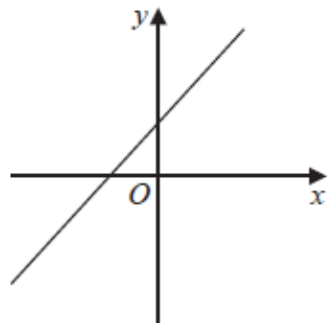
A



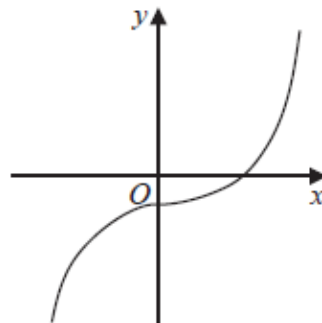
B



C



D



E

Equation	Graph
$y = \frac{2}{x}$	C
$y = x + 4$	D
$y = 6 - 3x$	A
$y = x^3 - 3$	E
$y = x^2 - 3x$	B

Match the letter of each graph with its equation.

(Total for Question 28 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS