



# Cambridge IGCSE™

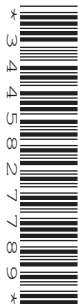
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**CAMBRIDGE INTERNATIONAL MATHEMATICS**

**0607/33**

Paper 3 (Core)

**May/June 2022**

**1 hour 45 minutes**

You must answer on the question paper.

You will need: Geometrical instruments

## INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You should use a graphic display calculator where appropriate.
- You may use tracing paper.
- You must show all necessary working clearly and you will be given marks for correct methods, including sketches, even if your answer is incorrect.
- Give non-exact numerical answers correct to 3 significant figures, or 1 decimal place for angles in degrees, unless a different level of accuracy is specified in the question.
- For  $\pi$ , use your calculator value.

## INFORMATION

- The total mark for this paper is 96.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **20** pages. Any blank pages are indicated.

**Formula List**

Area,  $A$ , of triangle, base  $b$ , height  $h$ .  $A = \frac{1}{2}bh$

Area,  $A$ , of circle, radius  $r$ .  $A = \pi r^2$

Circumference,  $C$ , of circle, radius  $r$ .  $C = 2\pi r$

Curved surface area,  $A$ , of cylinder of radius  $r$ , height  $h$ .  $A = 2\pi rh$

Curved surface area,  $A$ , of cone of radius  $r$ , sloping edge  $l$ .  $A = \pi rl$

Curved surface area,  $A$ , of sphere of radius  $r$ .  $A = 4\pi r^2$

Volume,  $V$ , of prism, cross-sectional area  $A$ , length  $l$ .  $V = Al$

Volume,  $V$ , of pyramid, base area  $A$ , height  $h$ .  $V = \frac{1}{3}Ah$

Volume,  $V$ , of cylinder of radius  $r$ , height  $h$ .  $V = \pi r^2 h$

Volume,  $V$ , of cone of radius  $r$ , height  $h$ .  $V = \frac{1}{3}\pi r^2 h$

Volume,  $V$ , of sphere of radius  $r$ .  $V = \frac{4}{3}\pi r^3$

Answer **all** the questions.

- 1 (a) Write sixteen thousand and twenty-four in numbers.

..... [1]

- (b) Write  $8\frac{2}{5}$  as a decimal.

..... [1]

- (c) Write down the square number between 10 and 20.

..... [1]

- (d) Work out  $\frac{3.2}{2.6+5.8}$ .

Give your answer correct to 5 significant figures.

..... [2]

- (e) Find the value of  $4.23^4$ .  
Give your answer correct to 1 decimal place.

..... [2]

- (f) Kelly buys candy bars that cost \$0.72 each.  
He buys the greatest number of candy bars he can with \$8.

- (i) Work out the number of candy bars that he buys.

..... [2]

- (ii) Work out how much change he receives.

\$ ..... [1]

- 2 The table shows the type of doughnut and the number of doughnuts sold in a shop on one day.

Type	Sugar	Raisin	Cream	Jam	Iced
Number	2000	2500	1500	1250	750

- (a) Find the total number of doughnuts sold.

..... [1]

- (b) Write down the most popular type of doughnut.

..... [1]

- (c) Work out how many more jam doughnuts were sold than iced doughnuts.

..... [1]

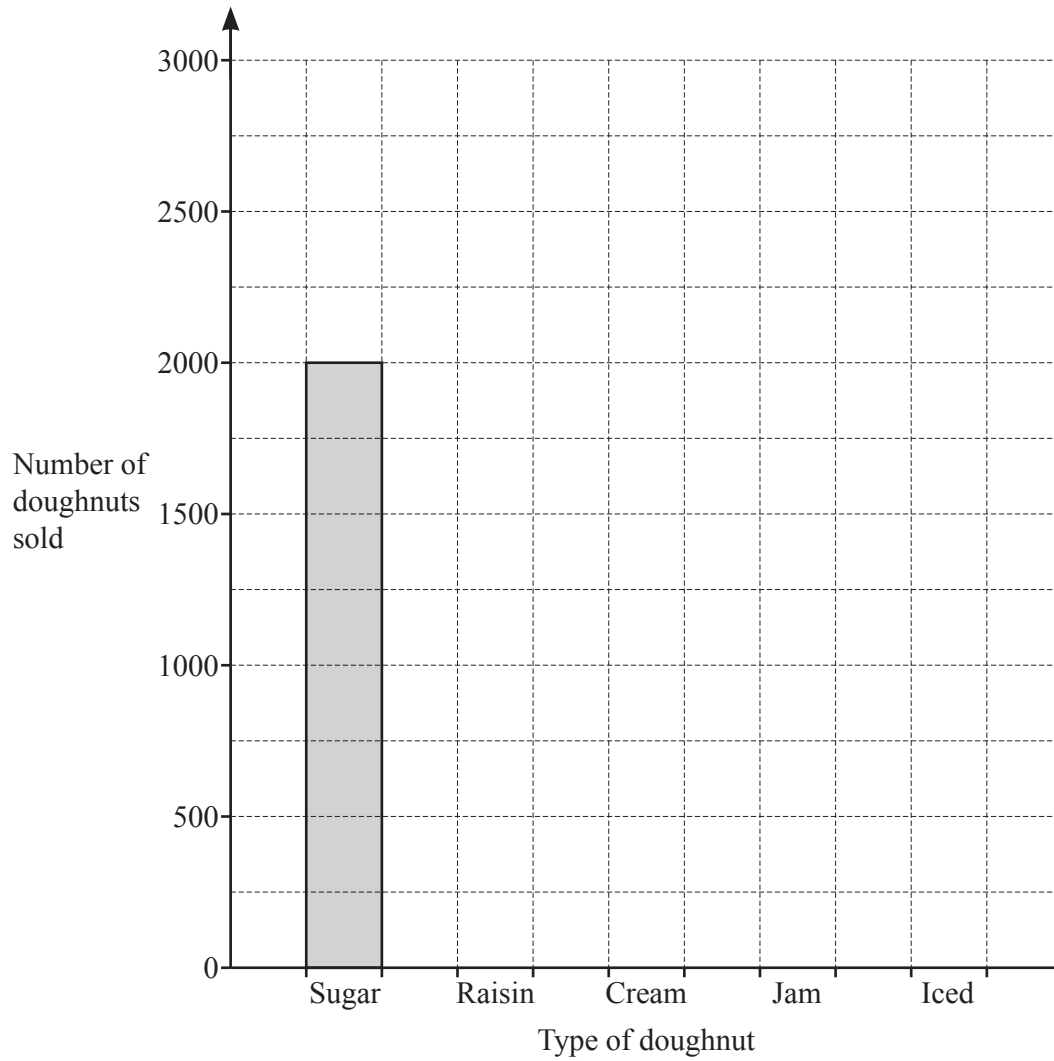
- (d) Work out the fraction of the doughnuts sold that were jam doughnuts.  
Give your answer as a fraction in its simplest form.

..... [2]

- (e) Write the ratio  $1500 : 1250 : 750$  in its simplest form.

..... : ..... : ..... [2]

(f) On the grid below, complete the bar chart to show the information in the table.



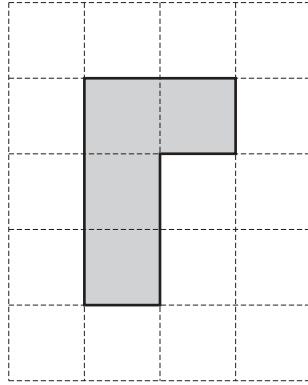
[2]

- (g) Sugar doughnuts cost \$1.25 each.  
Raisin doughnuts cost \$1.50 each.

Work out the total cost of 5 sugar doughnuts and 3 raisin doughnuts.

\$ ..... [2]

3 (a)



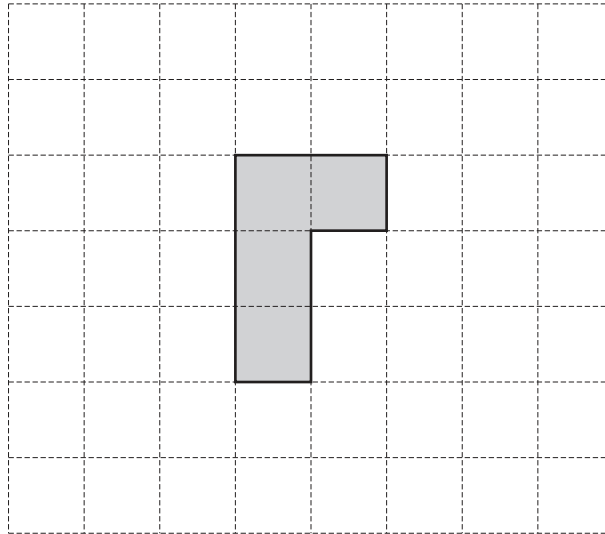
This shape is drawn on a  $1\text{ cm}^2$  grid.

Work out the perimeter and the area of the shape.  
Give the units of each answer.

Perimeter .....

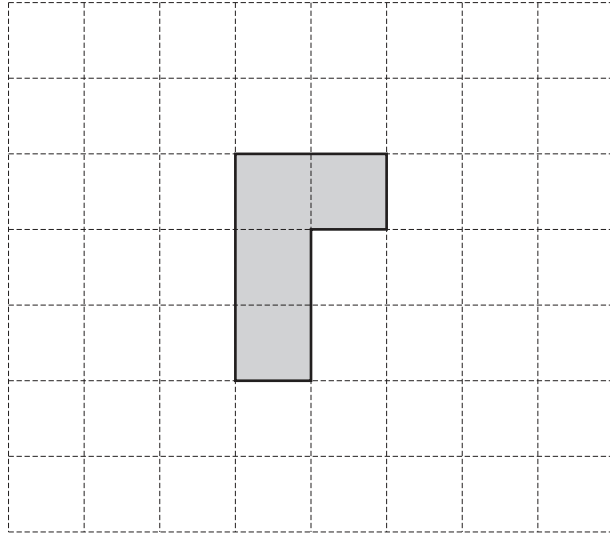
Area ..... [3]

(b)

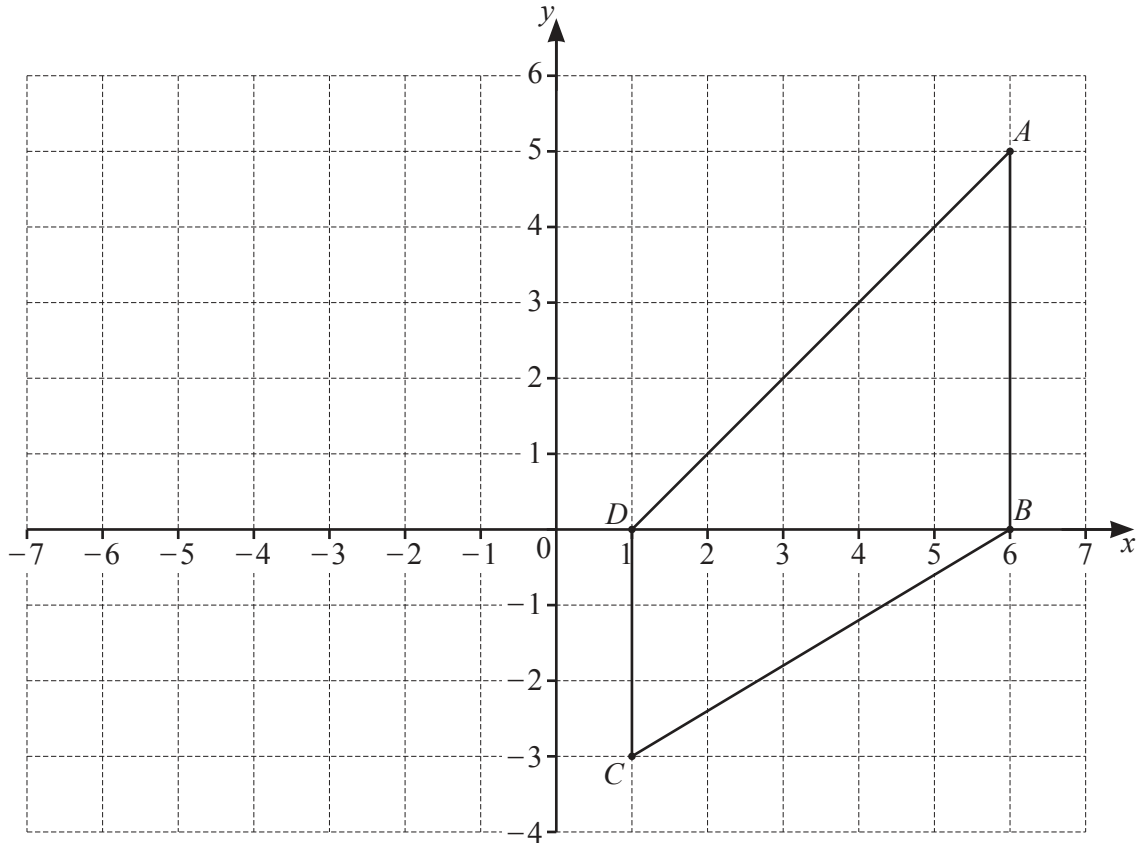


Add one more square to the shape above so that the shape has rotational symmetry of order 2. [1]

(c)



- (i) Add one more square to the shape above so that the shape has line symmetry. [1]
- (ii) On your shape, draw the line of symmetry. [1]



The diagram shows quadrilateral  $ABCD$  drawn on a  $1\text{ cm}^2$  grid.

(a) Write down the coordinates of points  $A$ ,  $B$  and  $C$ .

$A$  (....., .....) )

$B$  (....., .....) )

$C$  (....., .....) [3]

(b) Write down the mathematical name of

(i) quadrilateral  $ABCD$ ,

..... [1]

(ii) triangle  $BCD$ .

..... [1]



(c) Use Pythagoras' Theorem to calculate the length of  $AD$ .

$AD = \dots\dots\dots$  cm [2]

(d) Use trigonometry to calculate angle  $DCB$ .

Angle  $DCB = \dots\dots\dots$  [2]

(e) Reflect quadrilateral  $ABCD$  in the  $y$ -axis.

[1]

5 To hire a van, a company charges \$2.50 for each kilometre travelled plus a fixed charge of \$800.

(a) The total cost is  $T$  dollars when the distance travelled is  $k$  kilometres.

Write an equation for  $T$  in terms of  $k$ .

..... [2]

(b) Kiera hires a van and travels 324 kilometres.

Find the total amount she has to pay.

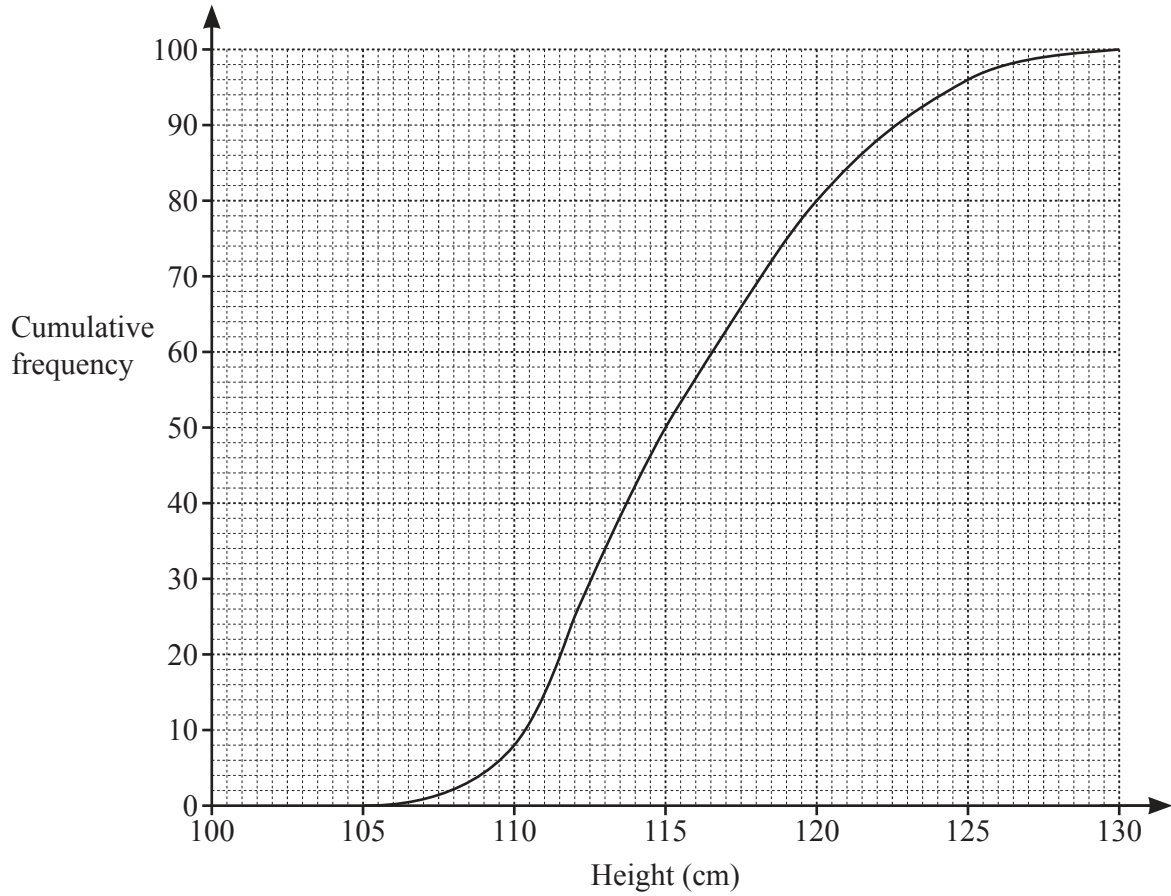
\$ ..... [2]

(c) Misty hires a van and pays \$1045.

Find how many kilometres she travels.

..... km [2]

6 The cumulative frequency curve shows the heights, in cm, of 100 adult Emperor penguins.



Use the curve to estimate

(a) the median,

..... cm [1]

(b) the lower quartile,

..... cm [1]

(c) the interquartile range,

..... cm [1]

(d) the number of Emperor penguins that have a height of 120 cm or more.

..... [2]

7 Greta joins a gym for one year.

(a) She can pay her membership every week, every month or in one payment for the whole year.

Payment type	Cost
Weekly	\$5.95
Monthly	\$25.00
Yearly	\$297.75

Work out which payment type is the cheapest.  
Show all your working.

..... [3]

(b) On the cycle machine, Greta cycles a distance of 3.2 km in 10 minutes.

Work out her average speed in km/h.

..... km/h [2]

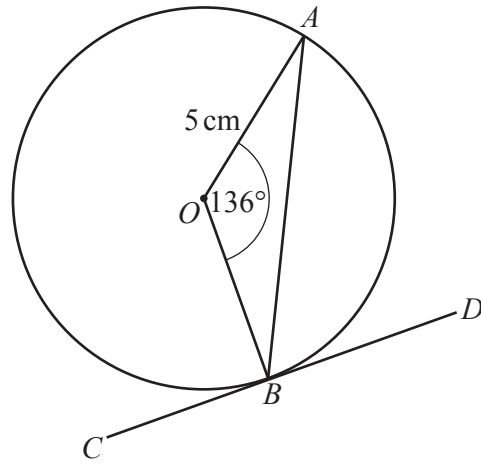
(c) On the treadmill, Greta walks at 6.3 km/h.

(i) Work out the distance she walks in 27 minutes.  
Give your answer in kilometres.

..... km [2]

(ii) Change 6.3 km/h to m/min.

..... m/min [2]



NOT TO SCALE

The diagram shows a circle, centre  $O$ , radius 5 cm.  
 Angle  $AOB = 136^\circ$  and  $CBD$  is a tangent to the circle at  $B$ .

(a) Find the size of

(i) angle  $OBC$ ,

Angle  $OBC = \dots\dots\dots$  [1]

(ii) angle  $OAB$ ,

Angle  $OAB = \dots\dots\dots$  [2]

(iii) angle  $ABD$ .

Angle  $ABD = \dots\dots\dots$  [1]

(b) Show that the area of the minor sector  $AOB$  is  $29.7 \text{ cm}^2$ , correct to 1 decimal place.

[2]

(c) Work out the length of the minor arc  $AB$ .

$\dots\dots\dots$  cm [2]

9 (a) Solve.

(i)  $6x = 42$

$x = \dots\dots\dots$  [1]

(ii)  $2x - 4 = 2$

$x = \dots\dots\dots$  [2]

(b) Factorise completely.

$$7b^2 - 14b$$

$\dots\dots\dots$  [2]

(c) Expand.

$$4(2a - 5)$$

$\dots\dots\dots$  [2]

(d) Solve the simultaneous equations.  
Show all your working.

$$5a - 2b = 12$$

$$6a + b = 11$$

$a = \dots\dots\dots$

$b = \dots\dots\dots$  [3]

(e) Find the value of  $x$  in each of the following.

(i)  $\frac{a^6}{a^2} = a^x$

$x = \dots\dots\dots$  [1]

(ii)  $a^3 \times a^x = a^{15}$

$x = \dots\dots\dots$  [1]

(f) Write as a single fraction in its simplest form.

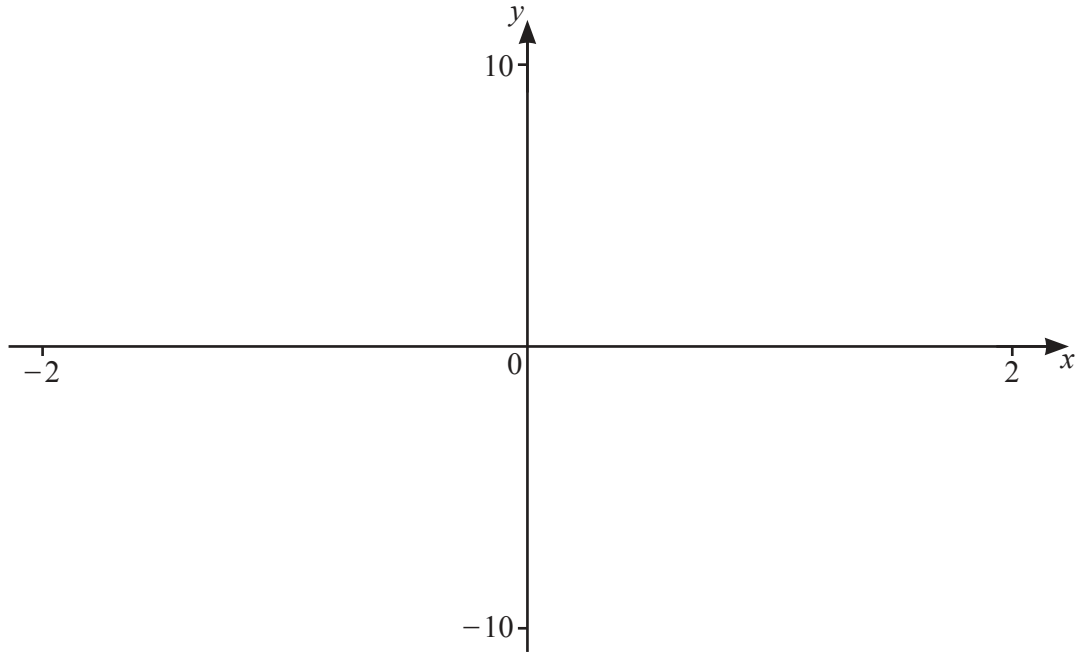
(i)  $\frac{x}{3} + \frac{2x}{5}$

$\dots\dots\dots$  [2]

(ii)  $\frac{mn^2}{5} \div \frac{m^2n}{15}$

$\dots\dots\dots$  [3]

10



(a) On the diagram, sketch the graph of  $y = x^3 + \frac{1}{x}$  for values of  $x$  between  $-2$  and  $2$ . [2]

(b) Write down the equation of the vertical asymptote.  
 ..... [1]

(c) Find the coordinates of the local minimum.  
 (....., .....) [2]

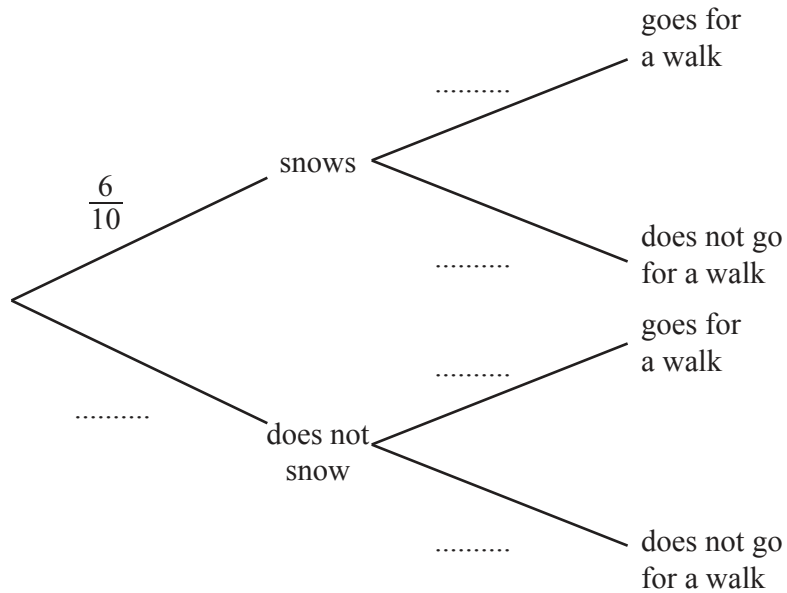
(d) On the same diagram, sketch the graph of  $y = 5x$  for  $-2 \leq x \leq 2$ . [2]

(e) Solve the equation  $x^3 + \frac{1}{x} = 5x$  for values of  $x$  between  $-2$  and  $2$ .  
 ..... and ..... [2]



- 11 The probability that it snows on any day in February is  $\frac{6}{10}$ .  
 If it snows, the probability that Maud goes for a walk is  $\frac{2}{5}$ .  
 If it does not snow, the probability that Maud goes for a walk is  $\frac{5}{7}$ .

(a) Complete the tree diagram to show this information.



[3]

(b) One day in February is chosen at random.

Find the probability that it snows and Maud does not go for a walk.

..... [2]





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