Cambridge Assessment International Education

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 π, 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.

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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.	$V = \frac{4}{3}\pi r^3$

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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.

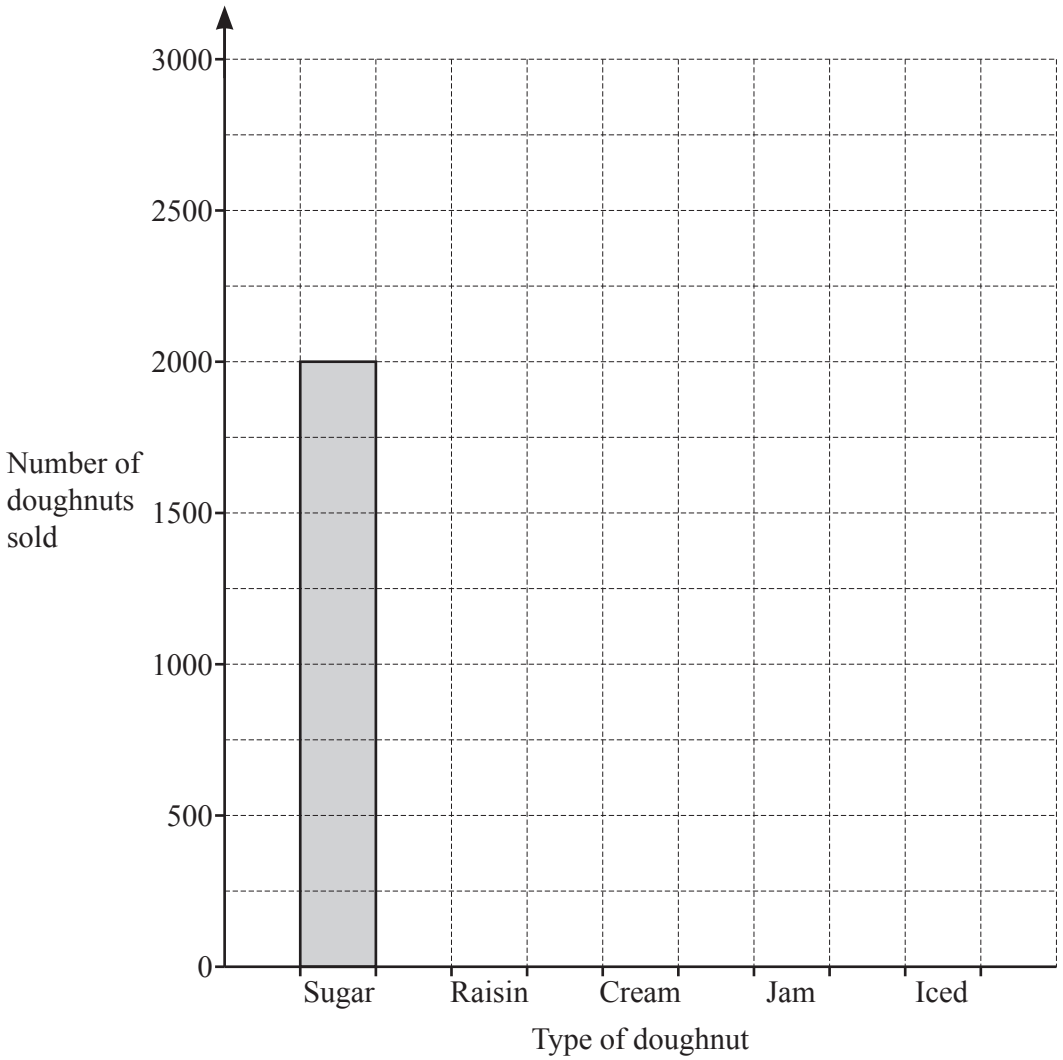
..... [2]

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

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

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



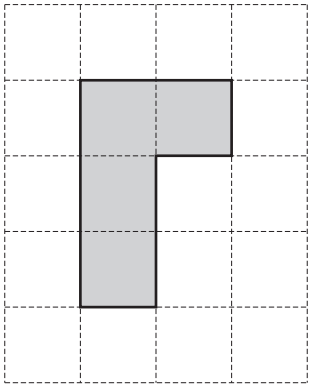
[2]

(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)



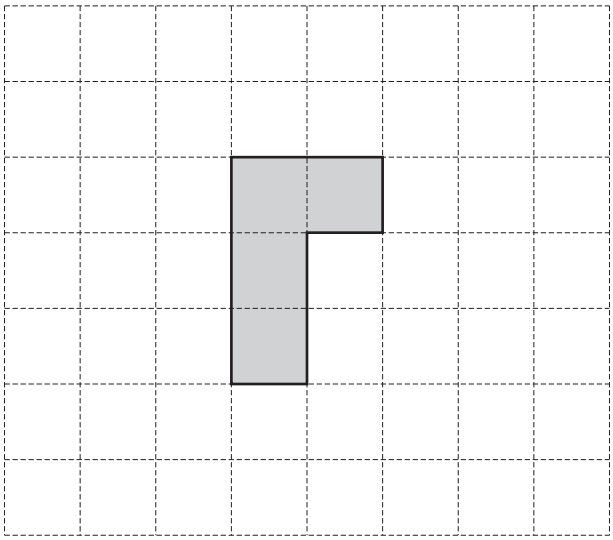
This shape is drawn on a $1\,cm^2$ grid.

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

Perimeter ....

Area .... [3]

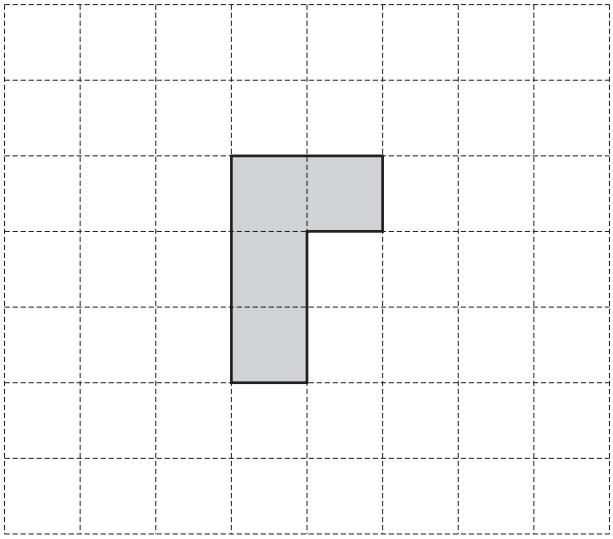
(b)



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

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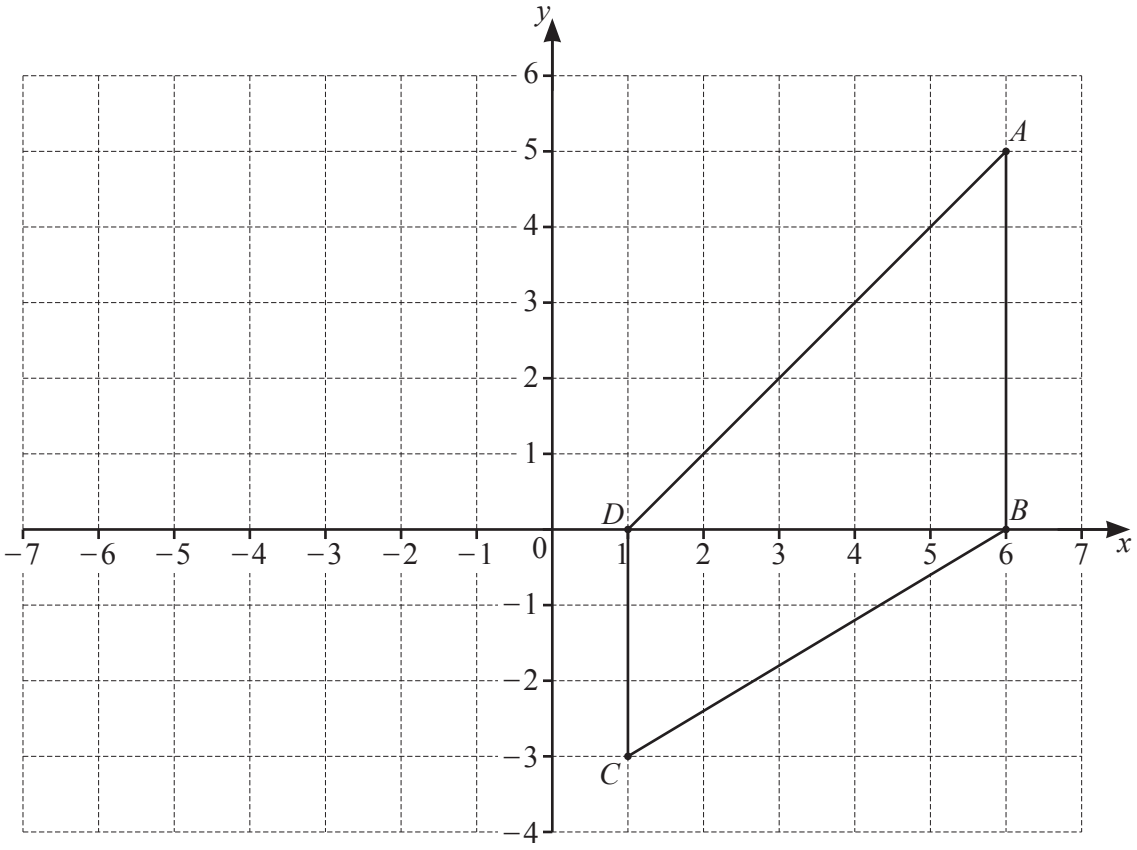
(c)



(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]

4



The diagram shows quadrilateral $ABCD$ drawn on a $1\,cm^2$ 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]

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

$AD =$ ..... cm [2]

(d) Use trigonometry to calculate angle DCB.

Angle $DCB =$ ..... [2]

(e) Reflect quadrilateral $ABCD$ in the y-axis. [1]

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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]

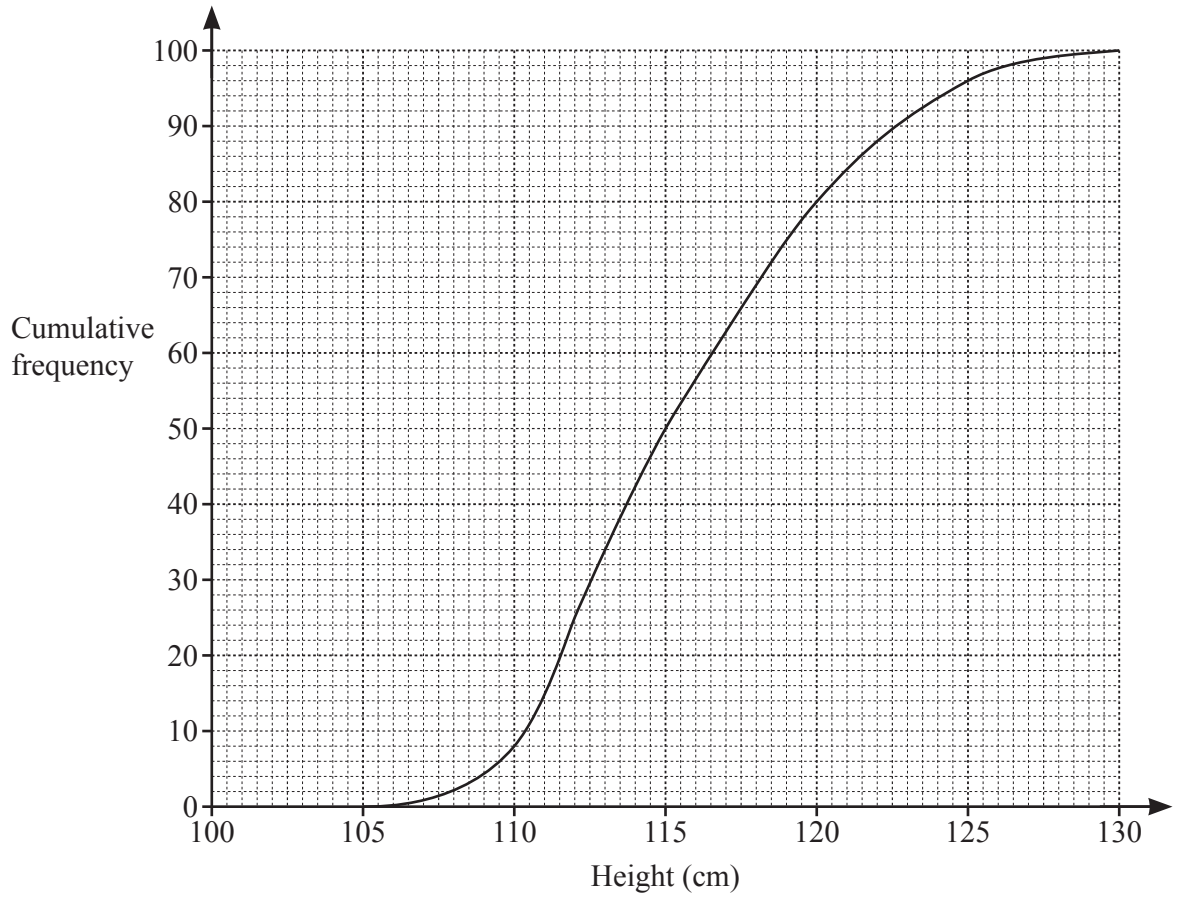
(c) Misty hires a van and pays \$1045.

Find how many kilometres she travels.

..... km [2]

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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.

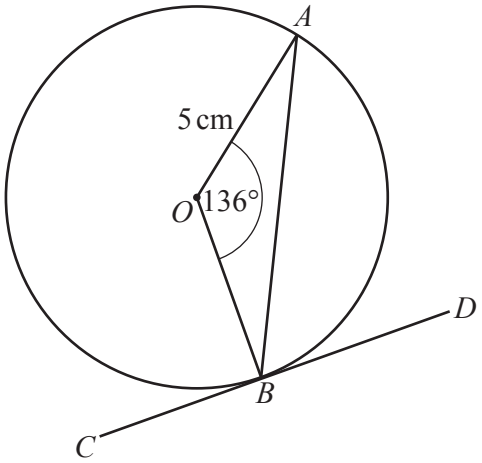
..... km [2]

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

..... m/min [2]

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8



NOT TO SCALE

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

(a) Find the size of

(i) angle OBC,

Angle $OBC =$ ..... [1]

(ii) angle OAB,

Angle $OAB =$ ..... [2]

(iii) angle ABD.

Angle $ABD =$ ..... [1]

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

[2]

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

..... cm [2]

9 **(a)** Solve.

(i) $6x = 42$

$x =$ ..... [1]

(ii) $2x - 4 = 2$

$x =$ ..... [2]

(b) Factorise completely.

$7b^2 - 14b$

..... [2]

(c) Expand.

$4(2a - 5)$

..... [2]

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

$$5a - 2b = 12$$
$$6a + b = 11$$

$a =$ .....

$b =$ ..... [3]

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

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

$x =$ ..... [1]

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

$x =$ ..... [1]

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

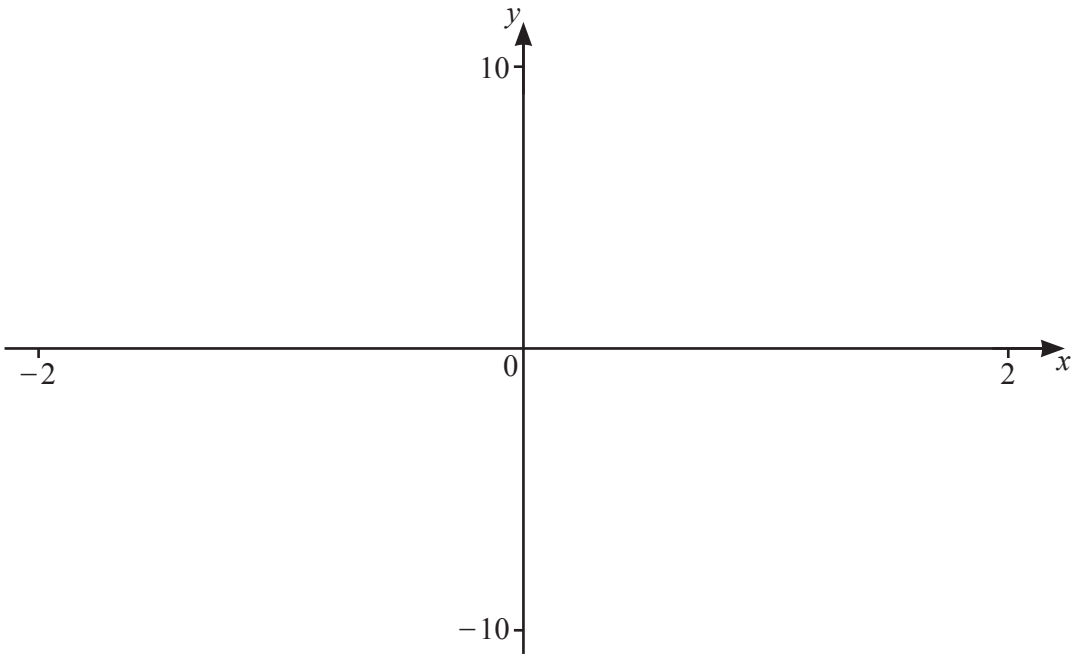
(i) $\frac{x}{3} + \frac{2x}{5}$

..... [2]

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

..... [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 $-2 \leqslant x \leqslant 2$. [2]

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

..... and ..... [2]

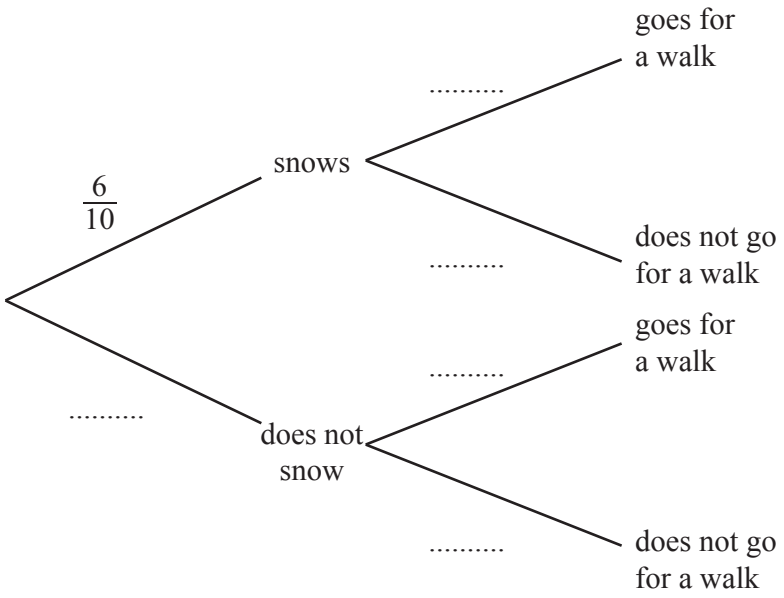
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11 The probability that it snows on any day in February is $\frac{6}{10}$.

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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