GCSE

wjec cbac

C300U20-1

A23-C300U20-1

eduqas
Part of WJEC

FRIDAY, 10 NOVEMBER 2023 – MORNING

MATHEMATICS – Component 2
Calculator-Allowed Mathematics
FOUNDATION TIER

2 hours 15 minutes

ADDITIONAL MATERIALS

An additional formulae sheet.

A calculator will be required for this examination.

A ruler, protractor and a pair of compasses may be required.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen.

Do not use gel pen or correction fluid.

You may use a pencil for graphs and diagrams only.

Write your name, centre number and candidate number in the spaces at the top of this page.

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

If you run out of space, use the additional page(s) at the back of the booklet, taking care to number the question(s) correctly.

Take π as 3·142 or use the π button on your calculator.

INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.

Unless stated, diagrams are not drawn to scale.

Scale drawing solutions will not be acceptable where you are asked to calculate.

The number of marks is given in brackets at the end of each question or part-question.

You are reminded of the need for good English and orderly, clear presentation in your answers.

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1.	7	
2.	3	
3.	5	
4.	4	
5.	3	
6.	4	
7.	6	
8.	3	
9.	4	
10.	6	
11.	5	
12.	4	
13.	5	
14.	9	
15.	5	
16.	4	
17.	4	
18.	4	
19.	3	
20.	4	
21.	5	
22.	5	
23.	8	
24.	4	
25.	6	
Total	120	

C300U201 01

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CJ/GR*(A23-C300U20-1)

1. The table below shows the costs to post letters and parcels.

Cost of posting		
	1st class	2nd class
Small letter	95p	68p
Large letter	£1.45	£1.05
Parcel	£4.45	£3.35

Use costs from the table to answer the following.

(a) Maria posts one 2nd class small letter and one 1st class parcel.
What is the total cost of posting these two items? [2]

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(b) How much less does it cost to post three large letters 2nd class than to post three large letters 1st class? [2]

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(c) Gareth spent £15.95 posting large letters 1st class.
How many letters did he post? [2]

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(d) Lee has £3.50.
Does he have enough money to post five small letters?

Yes ☐   No ☐

Give the reason for your answer. [1]

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(C3000U20-1)   **Turn over.**

2. **Shape A** is shown on the 1 cm grid.
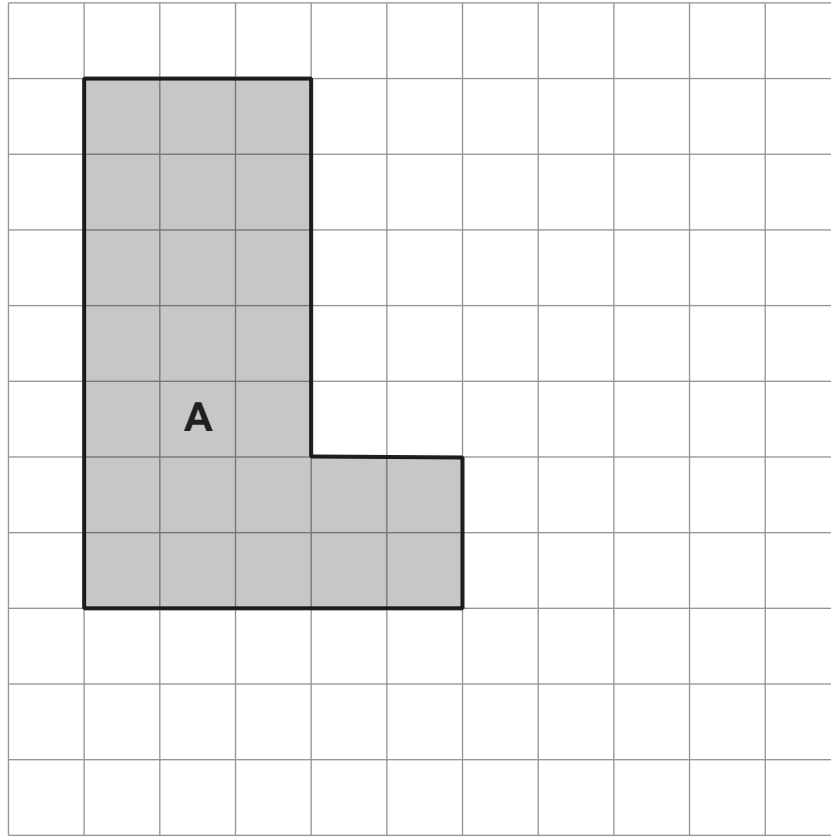
(a) On the grid below, draw a **square** that has the same area as **shape A**. [1]

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(b)   (i)   Work out the perimeter of **shape A**.   [1]

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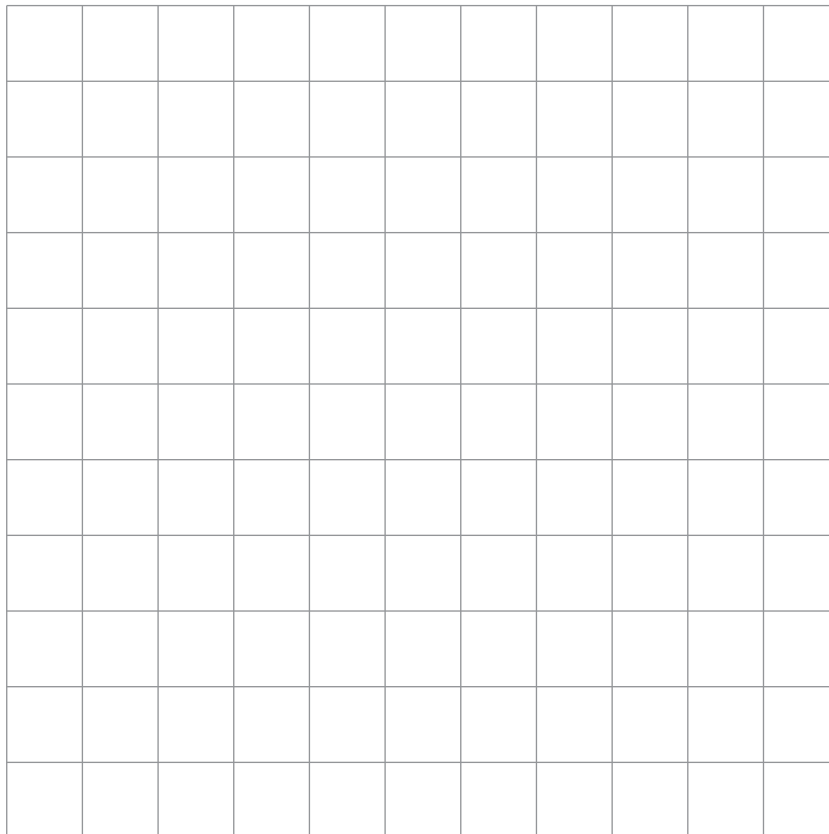
      (ii)   On the grid below, draw a **rectangle** that has the same perimeter as **shape A**. [1]

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3. (a) Write the number six million five hundred and twenty thousand in figures. [1]

....

(b) Shade $\frac{3}{5}$ of the shape below. [1]
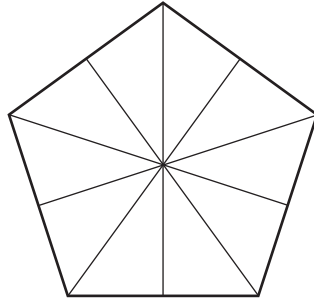
(c) Rearrange these five boxes to create a calculation with an answer of 8. [1]

| 4 | 6 | 24 | + | ÷ |

Write your calculation in the boxes below.

| | | | | | = | 8 |

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....

(d) Write 465 784

(i) correct to the nearest 10, [1]

....

(ii) correct to the nearest 1000. [1]

....

4. Two fair spinners are shown below.
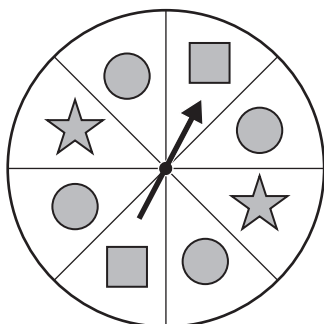
Spinner A   **Spinner B**
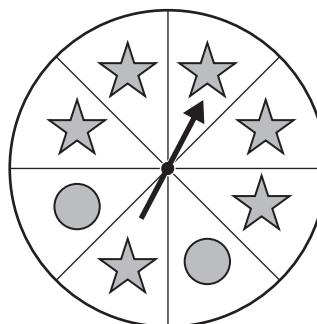
(a) Each spinner is spun once.

Circle the expression that best describes the chance of each of the following events occurring.

(i) Spinner A lands on a circle. [1]

impossible   unlikely   even chance   likely   certain

(ii) Spinner B lands on a square. [1]

impossible   unlikely   even chance   likely   certain

(b) Spinner B is spun once.
What is the probability it lands on a star?
Mark your answer with an arrow (↓) on the the probability scale below. [1]

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    ┌─────┬─────┬─────┬─────┬─────┬─────┬─────┬─────┐
    0                                               1
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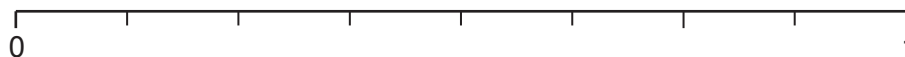
(c) A different spinner, spinner C, is spun once.

The probability that spinner C lands on a star is $\frac{3}{16}$.

What is the probability that spinner C does **not** land on a star? [1]

....

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5. (a) Calculate the value of x. [1]

$$3x°$$
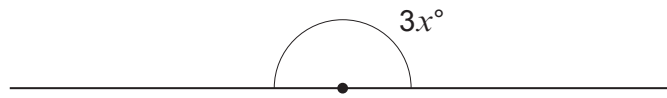
Diagram not drawn to scale

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$x =$ ....

(b) Calculate the value of y. [2]

$$5y°$$
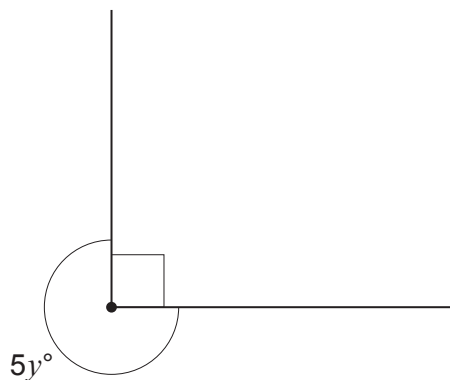
Diagram not drawn to scale

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$y =$ ....

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6. ABCD is a kite.
Three of its vertices have been plotted on the grid below.
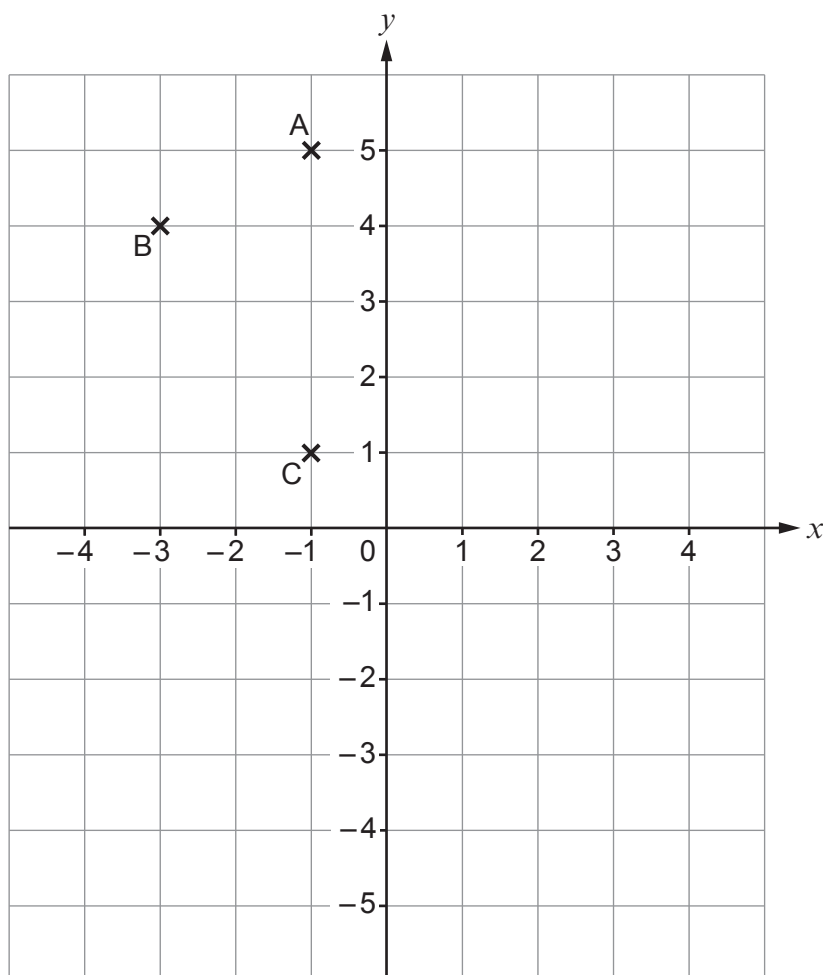
(a) Plot point D on the grid to complete the kite. [1]

(b) Write down the coordinates of point D. [1]

D = (...................... , ...)

(c) Draw a reflection of the kite ABCD in the x axis. [2]

(C3000U20-1)

Turn over.

C300U201
09

7. The graph below shows the average maximum daily temperature (ºC) and the average monthly rainfall (mm) in Greece.

Key: Temperature (°C) Rainfall (mm)
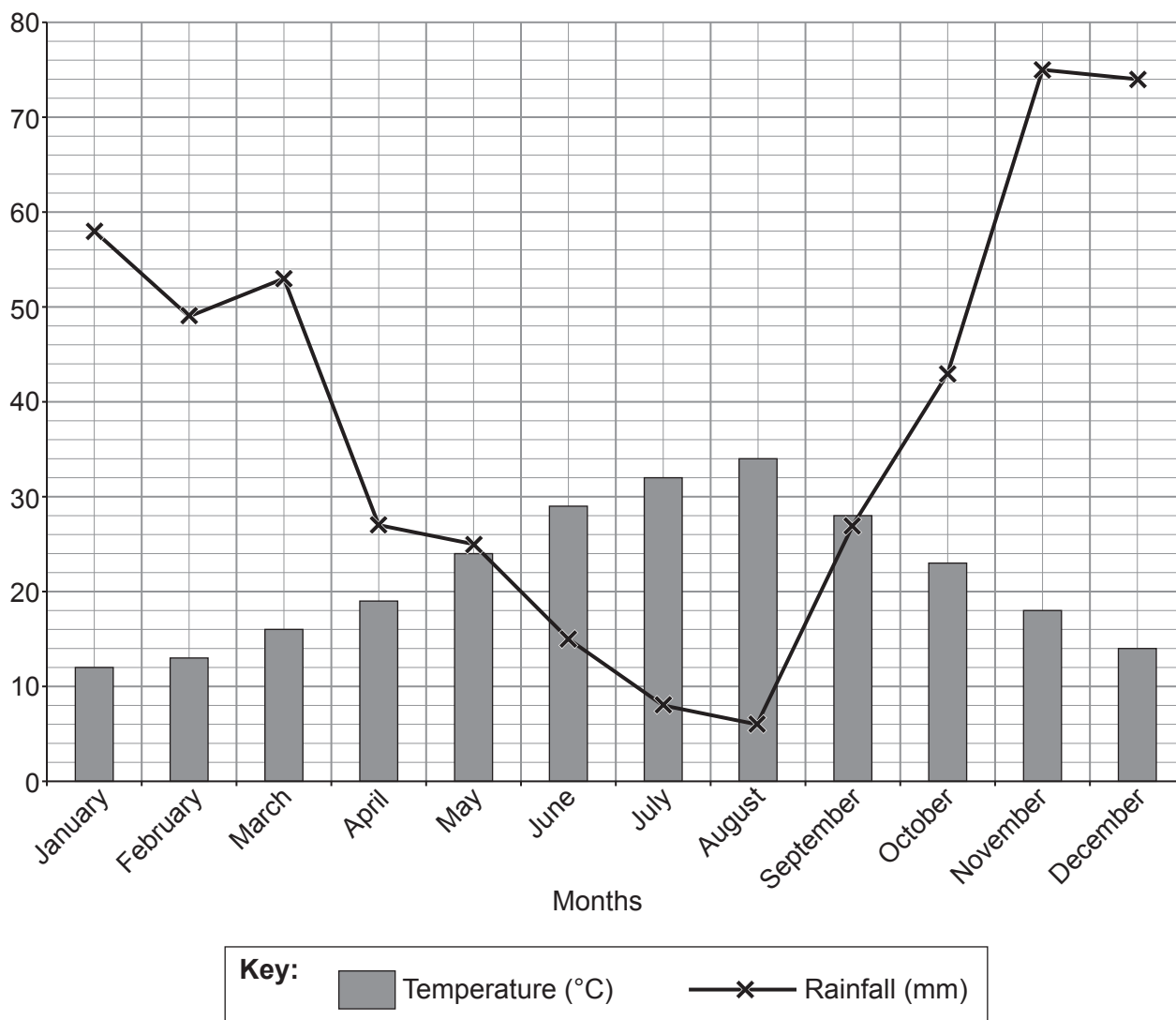
(a) (i) Which month has the highest rainfall? [1]

....

(ii) Calculate the difference in average maximum daily temperature between the warmest month and the coolest month. [2]

....

(iii) Courtney wants to go on holiday to Greece.
She does not want the average maximum daily temperature to be over 30°C and hopes for as little rain as possible.

Which month would be the most suitable for Courtney to go to Greece? [1]

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(C3000U20-1)

(b)   The formula shown below can be used to convert between temperatures in degrees Fahrenheit (F) and temperatures in degrees Celsius (C).

$$F = 1 \cdot 8C + 32$$

On a particular day in Greece, the temperature was 25°C.
Use the formula to convert this temperature to degrees Fahrenheit (F).   [2]

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C300U201
11

8. Alex and Louise buy some cereal bars and drinks at a shop.
The image below shows the items that Alex and Louise bought and their total cost.

Louise   CEREAL BAR   CEREAL BAR   CEREAL BAR   CEREAL BAR   Total cost £5

Alex   CEREAL BAR   [drink]   [drink]   [drink]   Total cost £5.60

Assume that:

- each cereal bar is identical
- each drink is identical.

Find the cost of one cereal bar and the cost of one drink.   [3]

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One cereal bar costs ....   One drink costs ....

9. The manager of a shop calculates the wages of her staff at the end of each week. She uses this diagram.

Weekly wages

| Number of hours worked | × | Hourly pay rate | + | Bonus | = | Total wage |

Hourly pay rates	
Junior sales assistant	£10.42
Senior sales assistant	£11.50
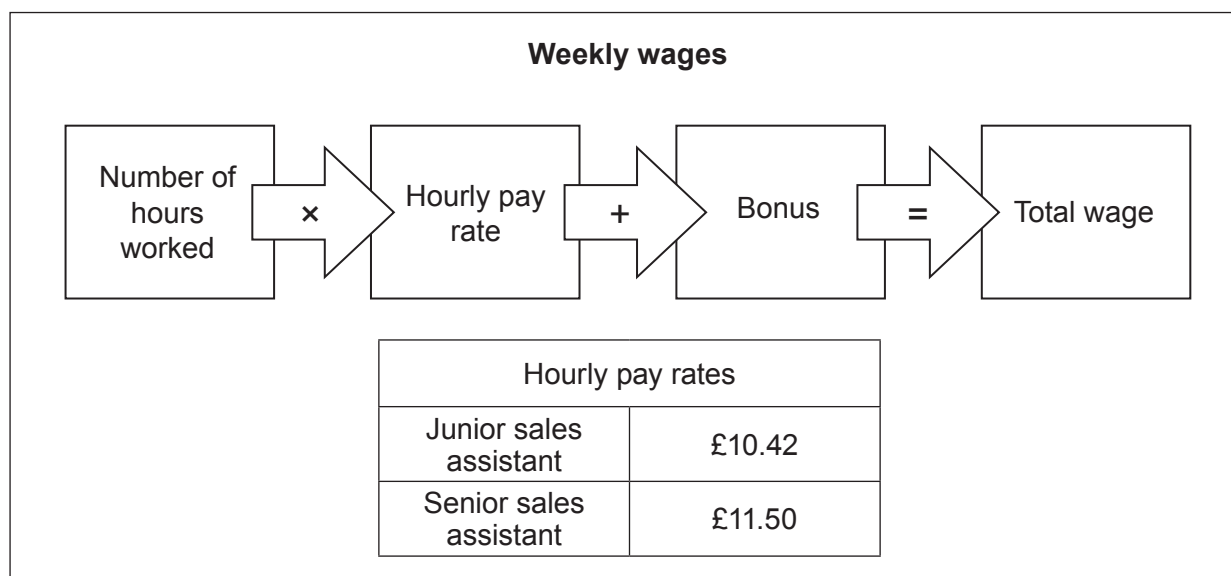
(a) Hamza is a junior sales assistant.
Last week he worked for 25 hours and had a bonus of £80.

What was Hamza's total wage last week? [2]

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(b) Julie is a senior sales assistant.
Last week her total wage was £271 including a bonus of £64.

How many hours did Julie work last week? [2]

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Turn over.

10. Jarrad won £3000 in a competition.

(a) He spent £500 and gave 37% of the remaining money to charity.
This was shared equally between five different charities.

How much did each charity receive? [4]

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Each charity received ....

(b) Jarrad saves £600 of the £3000.
What percentage of the £3000 does Jarrad save? [2]

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Jarrad saves .... % of the £3000.

(C3000U20-1)

11. (a) Simplify each of the following.

   (i) $a + 7b + 5a - 9b$ [2]

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   ....

   (ii) $6w \div 2w$ [1]

   ....

(b) Amanda buys 5 bags of apples. Each bag contains n apples.
She gives away 2 apples from **each bag**.

Write an expression for the total number of apples Amanda has left. [2]

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12. The Cowell family are planning a holiday to Spain for seven days.

They can either pay for a package deal or pay for return flights, accommodation and food separately.

The costs are shown below.

Package Deal

£2300

A seven-day holiday to Spain for a family of four.

Return flights, accommodation and food included.

Pay Separately

Return flights, accommodation, and food are free for children under 2 years old.

Return flights
£352 per person

Accommodation
£43 per person, per day

Food
£85 per person, for seven days

On the holiday there will be two adults and two children.
The children are aged 8 and 1 years old.
They each require return flights, accommodation and food.

The Cowell family wish to choose the cheaper option.

Which option should they choose?

Package Deal ☐   Pay Separately ☐

Show how you decide.   [4]

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13. (a) Three fair coins are thrown at the same time.

(i) Complete the table to list all the different possible outcomes. The first row has been completed for you. [2]

Coin 1	Coin 2	Coin 3
H	**H**	**H**

You may not need all the lines in the table.

(ii) Write down the probability that the outcome is three heads. [1]

(b) When four fair coins are thrown at the same time, the probability that the outcome is two heads and two tails is 0·375.

If the same four coins are thrown 136 times, how many times would you expect to get the outcome two heads and two tails? [2]

14. (a) The amount of electricity and gas used in a home is measured in units.

In the first week of May, the Singh family used 56 units of electricity and 245 units of gas.
The cost per unit of electricity is 32p.
The total cost for the units of electricity and gas the Singh family used in the first week of May was £39.97.

What is the cost of one unit of gas? [4]

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One unit of gas costs ....

(C3000U20-1)

(b) The Singh family are calculating their electricity bill for the 30 days of June.
- They use 210 units of electricity in June.
- The cost per unit of electricity is 32p.
- They pay a fixed charge of 28p per day.
- VAT at 5% is added to the total of these costs.

Calculate the total cost of the Singh family's electricity bill for June. [5]

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The total cost of the Singh family's electricity bill for June is ....

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15. Rhiannon cycled from her home to a park.
She cycled 15 miles along a straight road.
The graph shows her journey.

Distance from Rhiannon's home (miles)
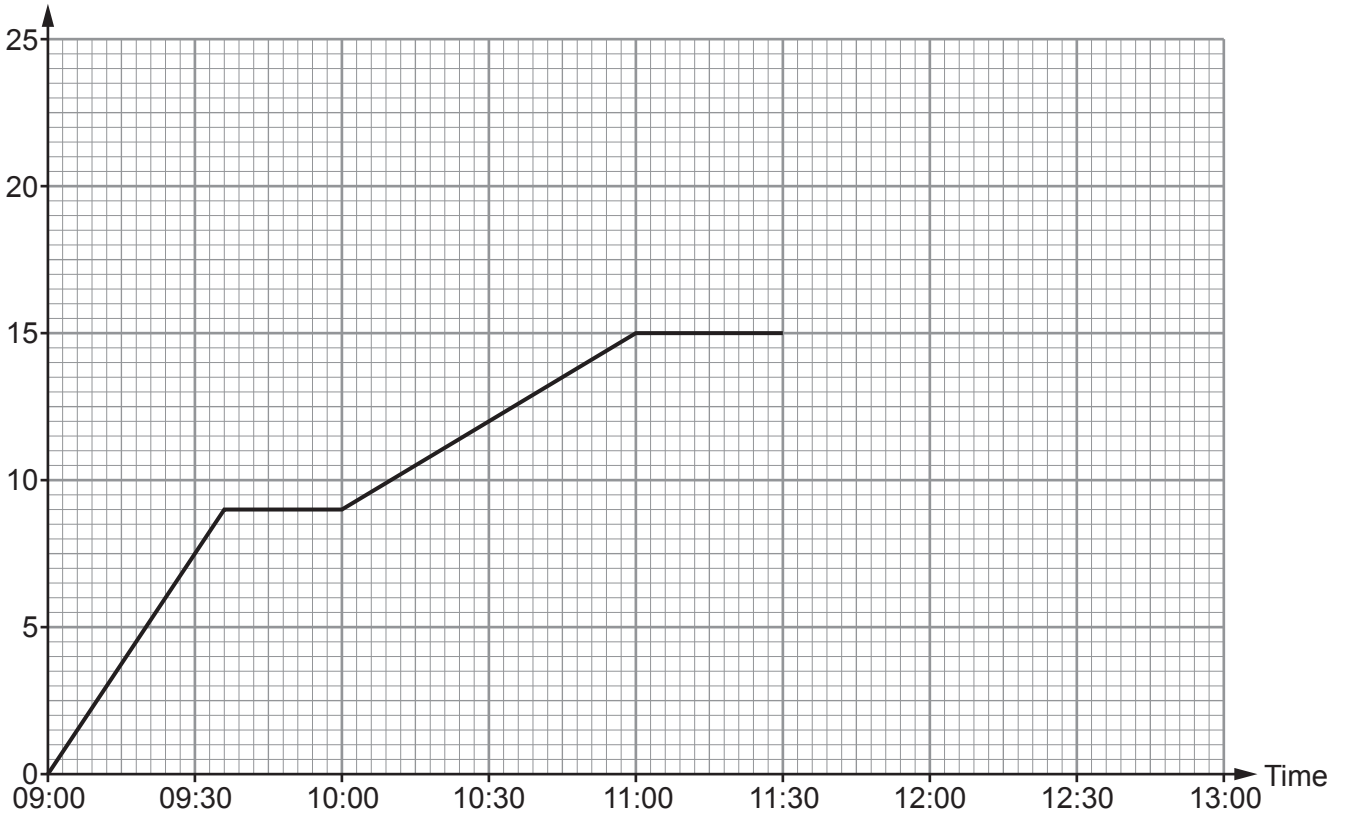
(a) On her journey to the park, Rhiannon had a puncture.
How long did Rhiannon stop to repair the puncture? [1]

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(b) Rhiannon was, on average, travelling faster before she had a puncture than after she had a puncture.
Without calculating any speeds, explain how you can tell this from the graph. [1]

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(c)   (i)   Rhiannon left the park at 11:30 and cycled back along the same road to a friend's house that is 5 miles from her home.
This journey took 45 minutes.
Draw this journey on the graph.   [1]

(ii)   Calculate the average speed of Rhiannon's journey from the park to her friend's house.
Give your answer in miles per hour.   [2]

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16. This is a map of a holiday park.
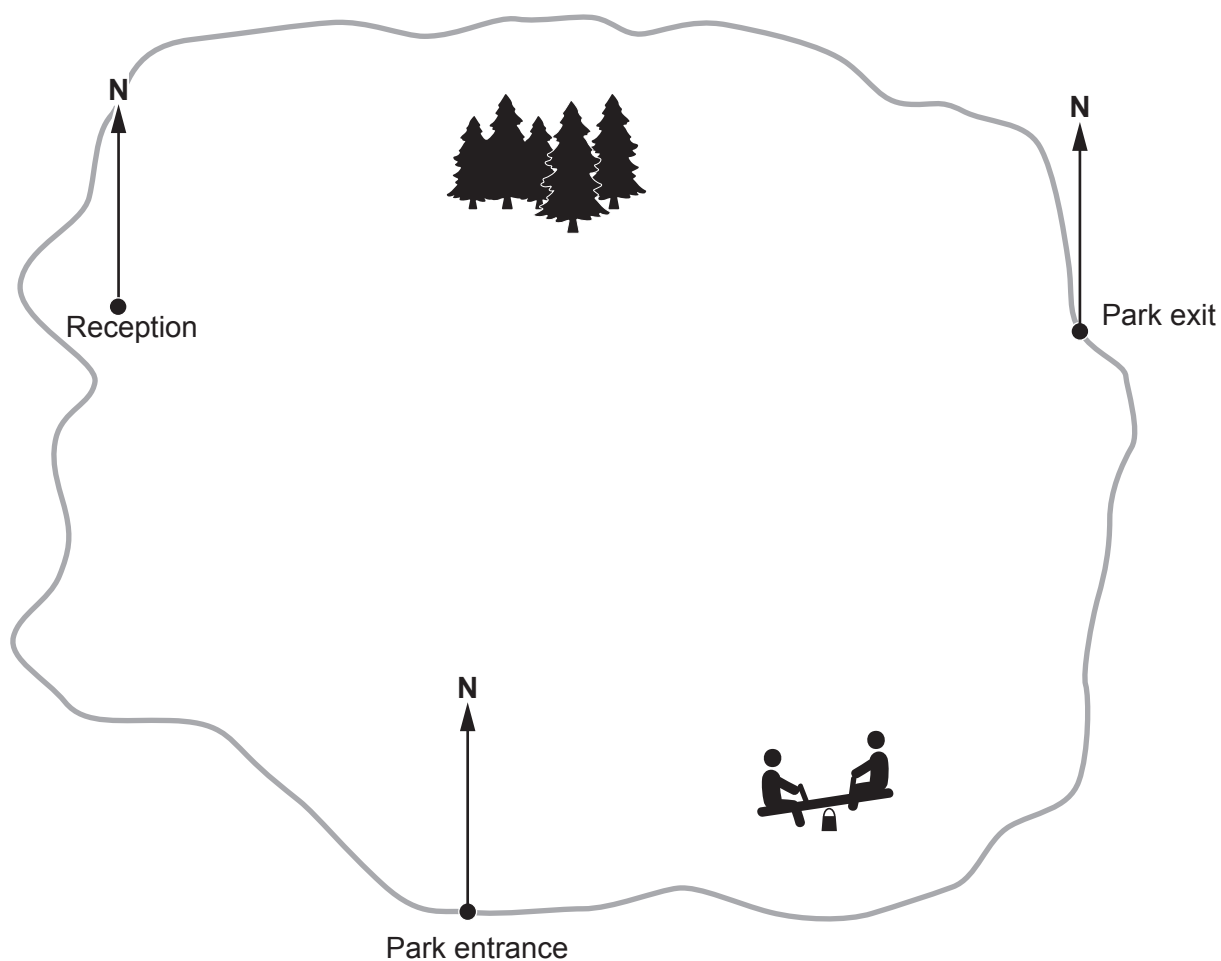
(a) Measure and write down the bearing of the Reception from the Park entrance. [1]

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(b) Amir is camping at the holiday park.
His tent is on a bearing of 025° from the Park entrance and 280° from the Park exit.

Mark with a T, the position of Amir's tent on the map. [3]

(C3000U20-1)

17. The universal set (Ɛ) contains the numbers 4, 9, 12, 18, 23, 32, 50, 64 and 72.

S is the set of square numbers.
F is the set of factors of 36.

(a)   Show this information on the Venn diagram below.   [2]

Ɛ

S   F

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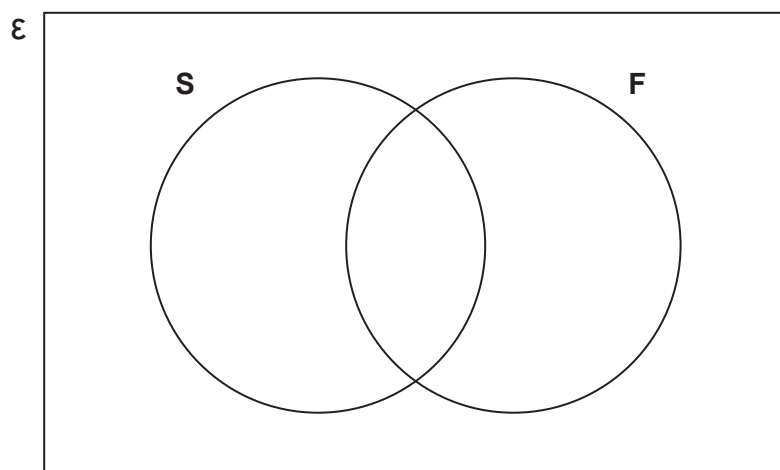
(b)   A number is selected at random from the universal set (Ɛ).

Find the probability that the number selected is a factor of 36 but **not** a square number.
[2]

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Turn over.

18. The grid below shows triangle A and triangle B.
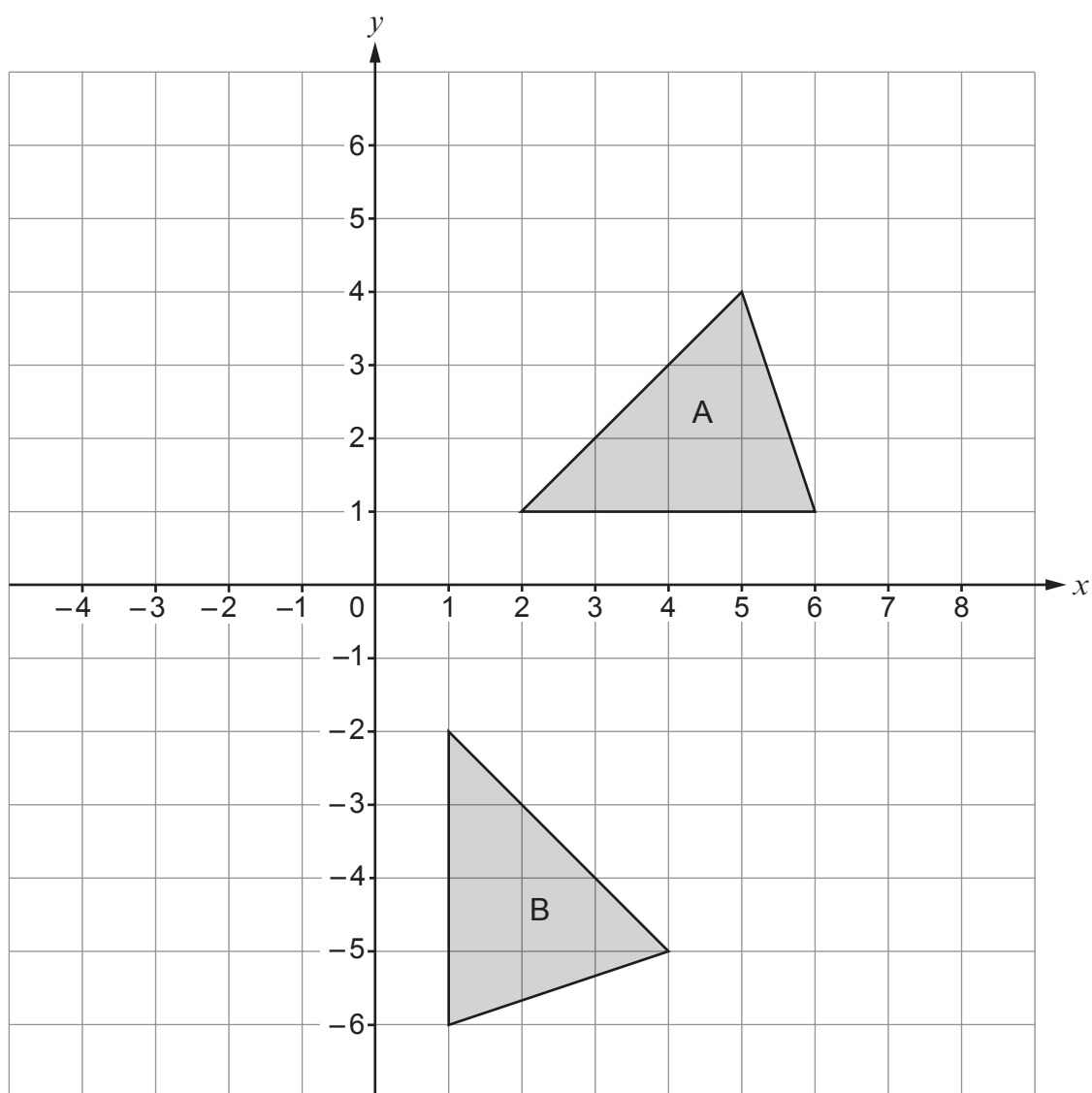
(a) Describe fully the single transformation that maps triangle A onto triangle B. [2]

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(b) Translate triangle A using the vector $\begin{pmatrix} -3 \\ 2 \end{pmatrix}$, label it C. [2]

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19. Shortbread biscuits are made from flour, butter and sugar.
Their masses are in the ratio 4 : 3 : 2 respectively.

(a) What fraction of a shortbread biscuit is made up of sugar? [1]

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(b) 1400 g of flour is used to make a batch of shortbread biscuits.
How many grams of butter is used for this batch of shortbread biscuits? [2]

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.... g of butter.

(C3000U20-1)

Turn over.

20. Lucy bought a car 9 years ago for £12 250.
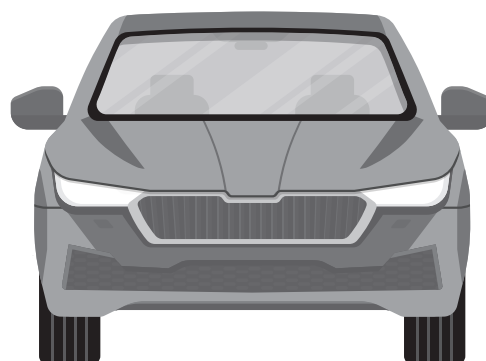
The car depreciated in value by 18% in the **first** year.
In each of the following years, her car depreciated by 15% of its previous year's value.

By how much has the car decreased in value in the last 9 years? [4]

Lucy's car has decreased in value by ....

(C3000U20-1)

21. Regan caught 70 fish on a fishing trip.
He measured the length of each of the fish in centimetres.

The table shows his results.

Length, l (centimetres)	Number of fish
$60 \leqslant l < 65$	19
$65 \leqslant l < 70$	17
$70 \leqslant l < 75$	23
$75 \leqslant l < 80$	10
$80 \leqslant l < 85$	1

(a) Calculate an estimate for the mean length of these fish. [4]

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(b) Regan thinks that the median length of fish is in the group $70 \leqslant l < 75$.
Is Regan correct?

Yes ☐   No ☐

Give the reason for your answer. [1]

....

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....

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22. Jan has a large piece of card.
The card has width 60 cm and length 96 cm.

96 cm

60 cm
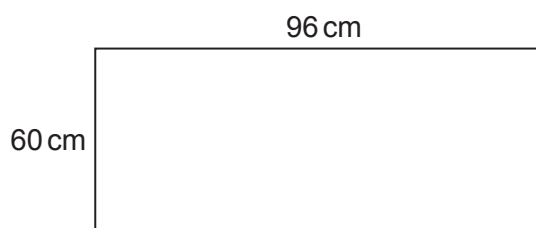
She uses a machine to cut identical circles out of the card.
Each circle has a radius of 6 cm.

6 cm
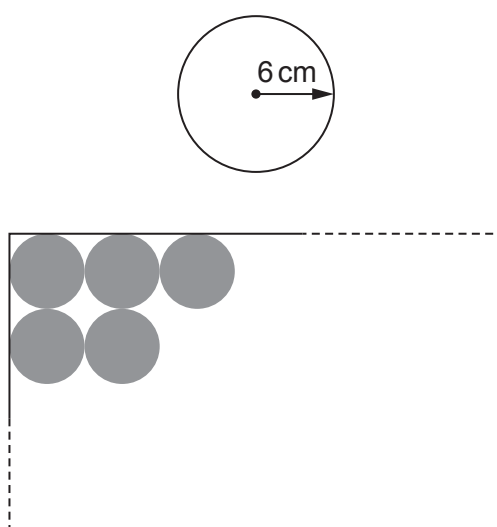
Diagram not drawn to scale

Jan has cut five circles as shown on the diagram above.
She continues in this way to cut as many circles as possible from the card.

(a) What is the maximum number of circles Jan can cut out of the card? [1]

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(C3000U20-1)

(b)   Jan cuts out the maximum number of circles from the card.
      What area of card is left over?   [4]

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Area of card left over ....

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23. (a) Expand and simplify $(x+3)(x+7)$. [2]

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(b) Solve $7x+6=4x+7$. [2]

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(c) Factorise y^2-400. [1]

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(d) Solve the following simultaneous equations. [3]

$$7x-3y=26$$

$$x+y=3$$

You must show all your working.

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$x =$ .... $y =$ ....

(C3000U20-1)

24. The two shapes below are similar.

19·5 cm

r cm

15·6 cm

t cm

7·6 cm

10·4 cm
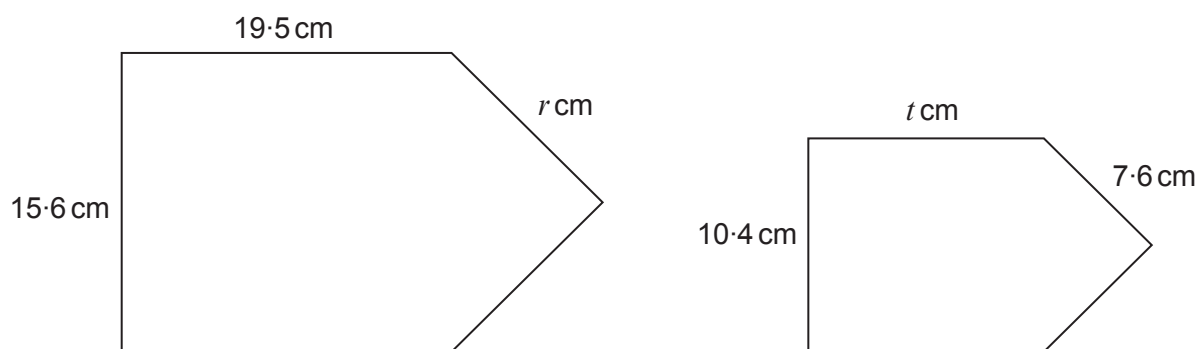
Diagram not drawn to scale

Find the value of r and the value of t. [4]

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r = ... t = ...

Turn over.

25. Vaughan cycles down a track from the top of a mountain to the bottom.
The track goes down at an angle of 48° to the horizontal.
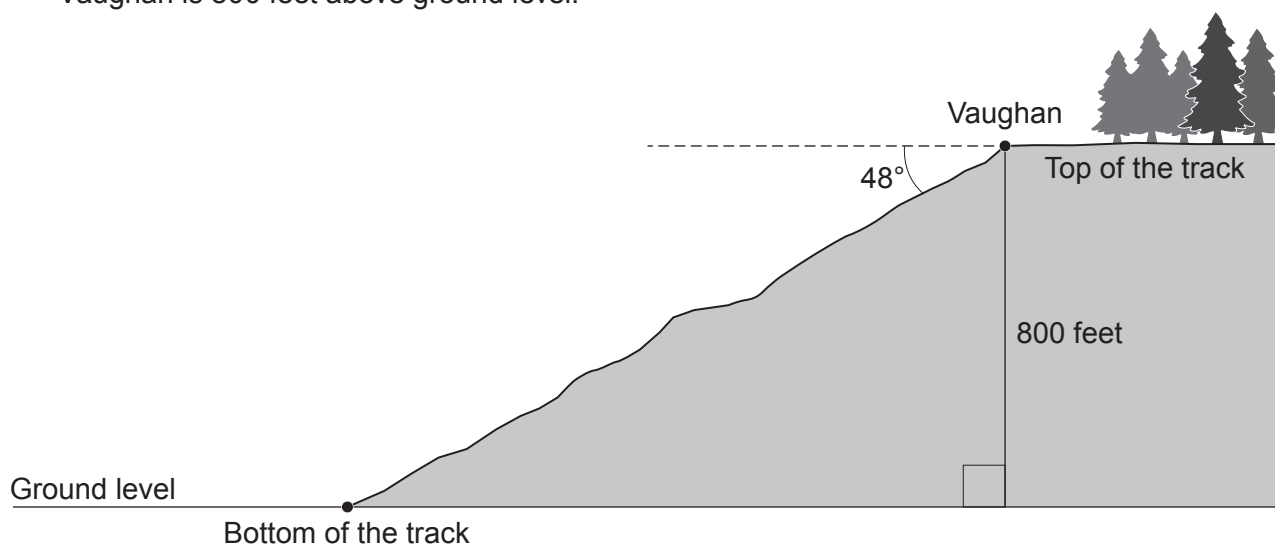Vaughan is 800 feet above ground level.

Vaughan

48°

Top of the track

800 feet

Ground level

Bottom of the track

Diagram not drawn to scale

(a) Vaughan cycles from the top of the track to the bottom of the track.
What distance has he cycled? [4]

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....

....

....

The distance Vaughan has cycled is .... feet.

(b) (i) State an assumption you have made in answering part (a). [1]

....

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(ii) If your assumption is not correct, what effect would this have on your answer to
part (a)? [1]

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END OF PAPER

(C3000U20-1)