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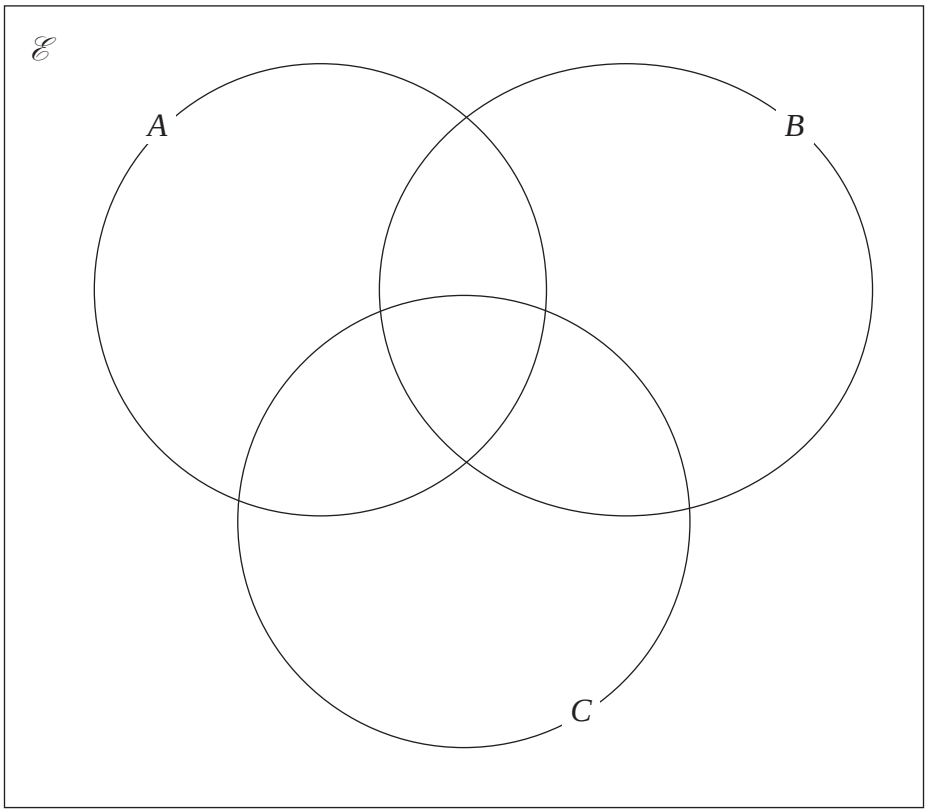
Question 1 continued

Only use this Venn diagram if you wish to replace your answer to part (a)



(Total for Question 1 is 9 marks)

2 Each year the students at a college organise a music concert.

In 2017, the total cost of organising the concert was \$675
In 2018, the total cost of organising the concert was 20% more than the total cost in 2017

(a) Calculate the total cost of organising the concert in 2018

(2)

The tickets sold each year were either adult tickets or student tickets.

In 2019, the total number of tickets sold was 385
In 2019, the number of adult tickets sold and the number of student tickets sold were in the ratio

number of adult tickets : number of student tickets = 19 : 16

(b) Calculate the number of adult tickets sold in 2019

(2)

In 2019, the price of each adult ticket sold was \$8.50 and the price of each student ticket sold was \$4.50

(c) Calculate the total amount of money, in \$, received for all the tickets sold in 2019

(2)

In 2019, the total cost of organising the concert was double the total cost in 2017

(d) Calculate the percentage profit made in 2019
Give your answer to 1 decimal place.

(2)

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Question 2 continued

(Total for Question 2 is 8 marks)

3 The equation of a curve is $y = -2x^3 + 6x + \frac{5}{x^2}$

(a) Complete the table of values for $y = -2x^3 + 6x + \frac{5}{x^2}$

Give your values of y to 2 decimal places where necessary.

x	−2	−1.8	−1.7	−1.6	−1.4	−1.2	−1	−0.9	−0.8
y	5.25	2.41		0.55	−0.36		1		4.04

(2)

(b) On the grid opposite, plot the points from your completed table and join them to form a smooth curve.

(3)

(c) Use your graph to find an estimate, to 2 decimal places, for the minimum value of $-2x^3 + 6x + \frac{5}{x^2}$ for values of x in $-2 \leqslant x \leqslant -0.8$

(1)

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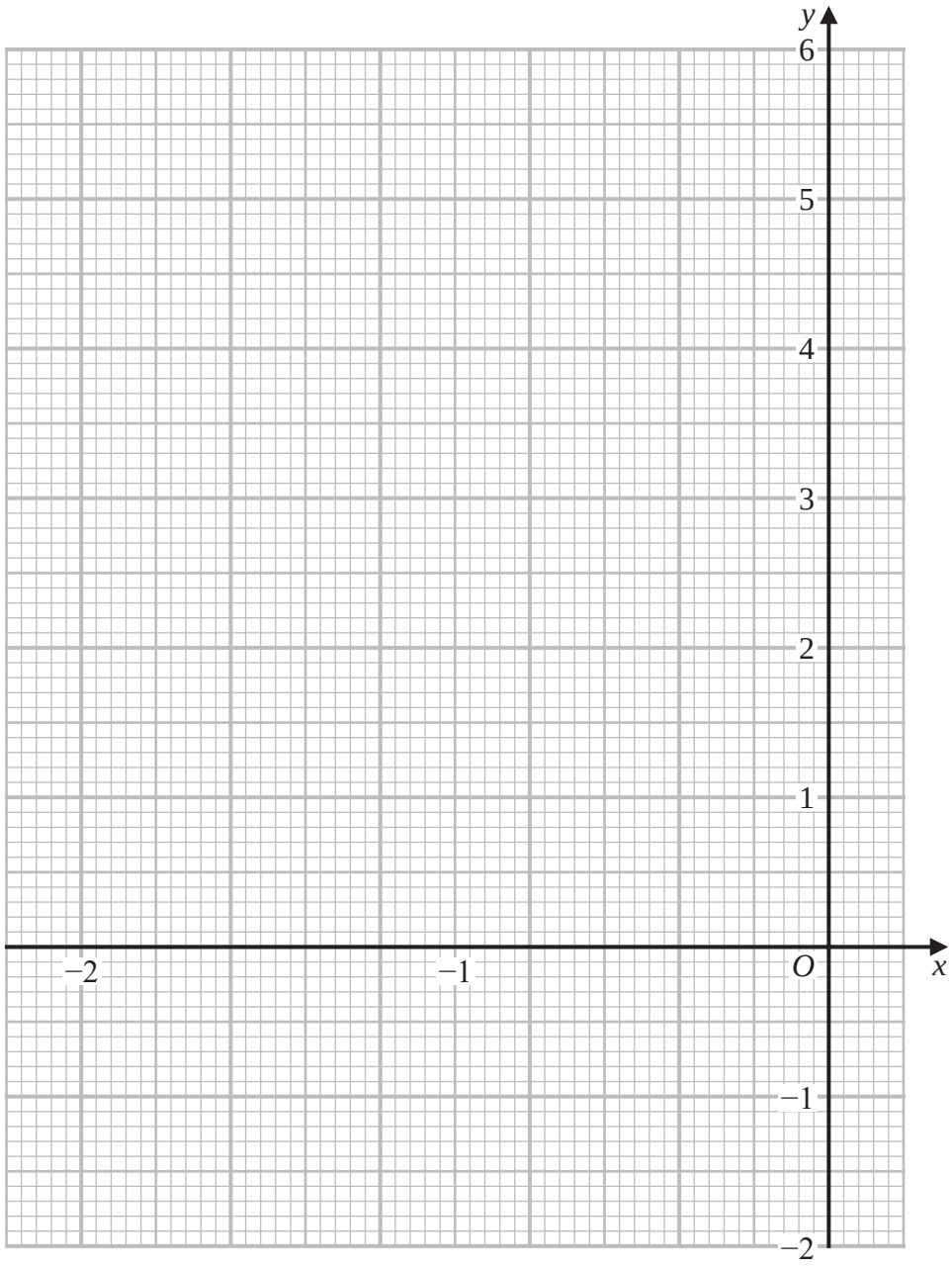
Question 3 continued



Turn over for a spare grid if you need to redraw your curve.

Question 3 continued

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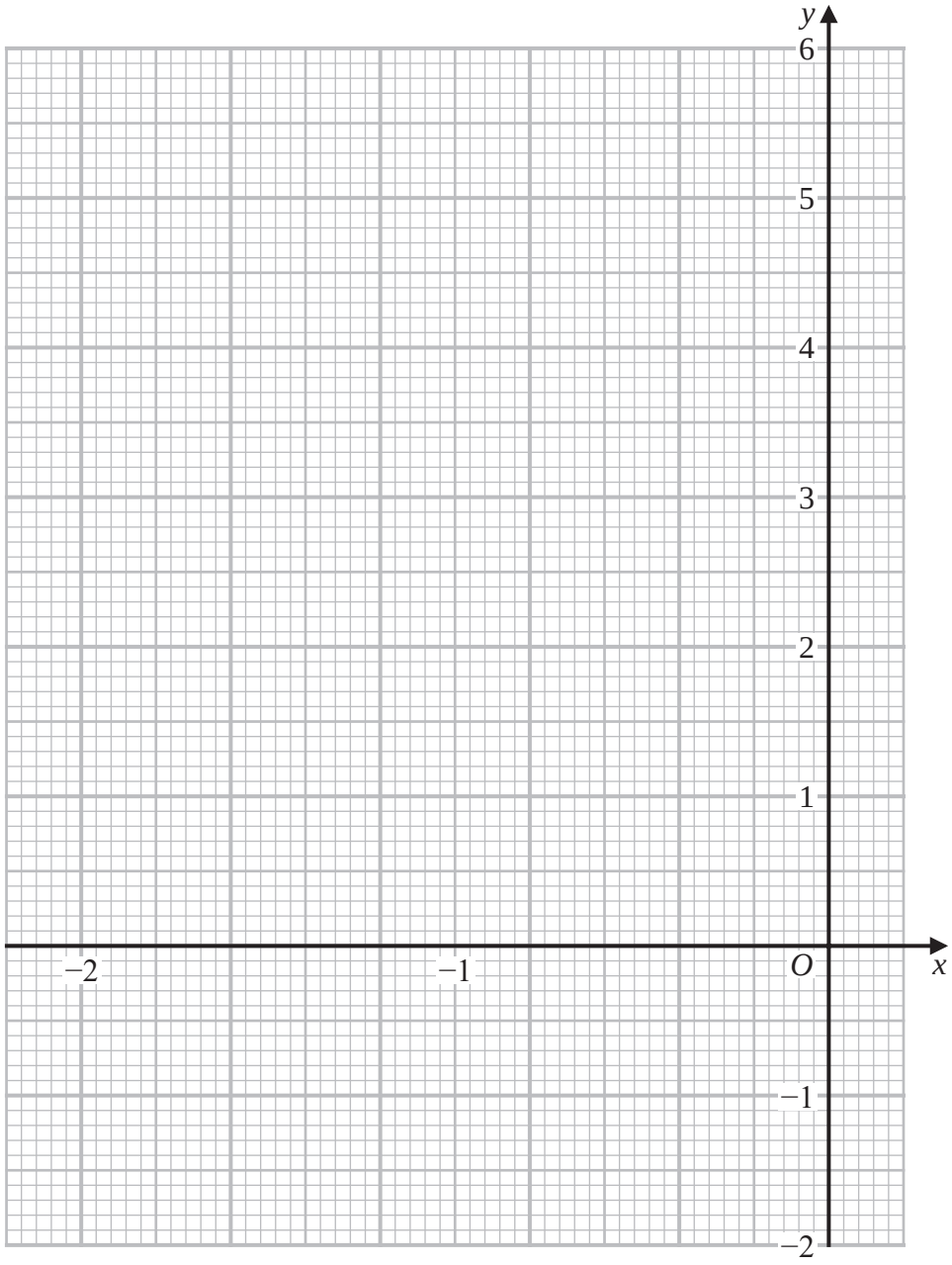
Question 3 continued

Only use this grid if you need to redraw your curve.



(Total for Question 3 is 6 marks)

4 Ramesh, Maya, Kalil, Chen and Andreia each have a bag containing an identical set of six cards.

There is a number on each of the six cards.
Here are the cards in each of the bags.

2	4	4	7	9	10

Ramesh takes at random **one** of the six cards in his bag.

(a) Write down the probability that the number on the card Ramesh takes is a prime number.

(1)

Maya takes at random from her bag **two** of the six cards in her bag.

(b) Find the probability that neither of the two cards has a number **4** on it.

(2)

Kalil takes at random from his bag **two** of the six cards in his bag.

(c) Find the probability that the total of the two numbers on the cards is 11

(2)

Chen takes at random **one** card at a time, without replacement, from her bag until she gets a card with a number **4** on it. She then stops taking cards from her bag.

(d) Find the probability that Chen stops taking cards from her bag before she takes the fourth card.

(2)

Andreia puts another card with a number on it into her bag so that she has seven cards in her bag.

The mean of the numbers on the seven cards in Andreia's bag is 8

(e) Find the value of the number on the card that Andreia put into her bag.

(2)

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Question 4 continued

Question 4 continued

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Question 4 continued

(Total for Question 4 is 9 marks)

5

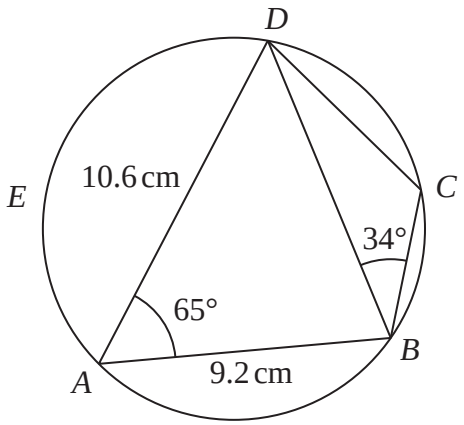

Diagram **NOT** accurately drawn

Figure 1

In Figure 1, *ABCDE* is a circle.

$AB = 9.2\,\text{cm}$ $AD = 10.6\,\text{cm}$ $\angle BAD = 65°$ $\angle CBD = 34°$

(a) Calculate the length, in cm to 3 significant figures, of *BD*.

(2)

(b) Explain why $\angle BCD = 115°$

(1)

(c) Calculate the length, in cm to 3 significant figures, of *BC*.

(2)

The point *E* is such that ΔBDE is isosceles, with $DE = BE$.

(d) Calculate the area, in cm^2 to 3 significant figures, of the quadrilateral *BCDE*.

(4)

$$\left[\begin{array}{c}\textbf{Cosine rule } a^2 = b^2 + c^2 - 2bc\cos A \\ \textbf{Sine rule } \dfrac{a}{\sin A} = \dfrac{b}{\sin B} = \dfrac{c}{\sin C} \\ \textbf{Area of triangle } = \dfrac{1}{2}ab\sin C\end{array}\right]$$

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Question 5 continued

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Question 5 continued

(Total for Question 5 is 9 marks)