

2.

$$y = \frac{x}{\sqrt{1+x}}$$

- (a) Complete the table below with the value of y corresponding to $x = 1.3$, giving your answer to 4 decimal places.

(1)

x	1	1.1	1.2	1.3	1.4	1.5
y	0.7071	0.7591	0.8090		0.9037	0.9487

- (b) Use the trapezium rule, with all the values of y in the completed table, to obtain an approximate value for

$$\int_1^{1.5} \frac{x}{\sqrt{1+x}} dx$$

giving your answer to 3 decimal places.

You must show clearly each stage of your working.

(4)

[illegible]

(4)

(2)

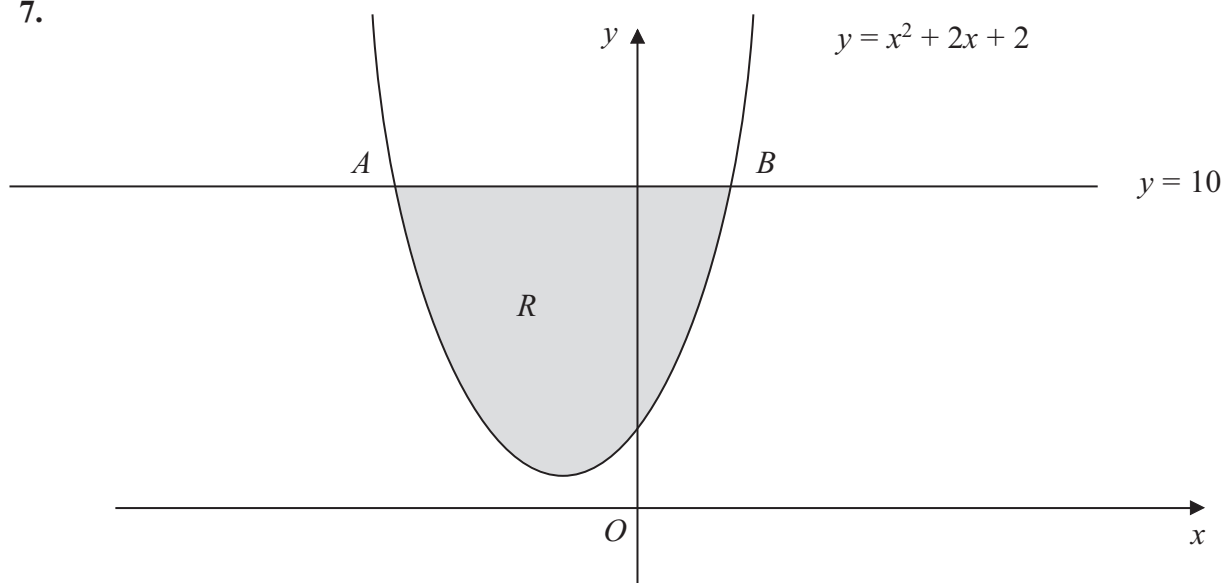
(2)

(3)









The line with equation $y = 10$ cuts the curve with equation $y = x^2 + 2x + 2$ at the points A and B as shown in Figure 1. The figure is not drawn to scale.

- The shaded region R is bounded by the line with equation $y = 10$ and the curve as shown in Figure 1.

- (b) Use calculus to find the exact area of R . (7)

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.



8.

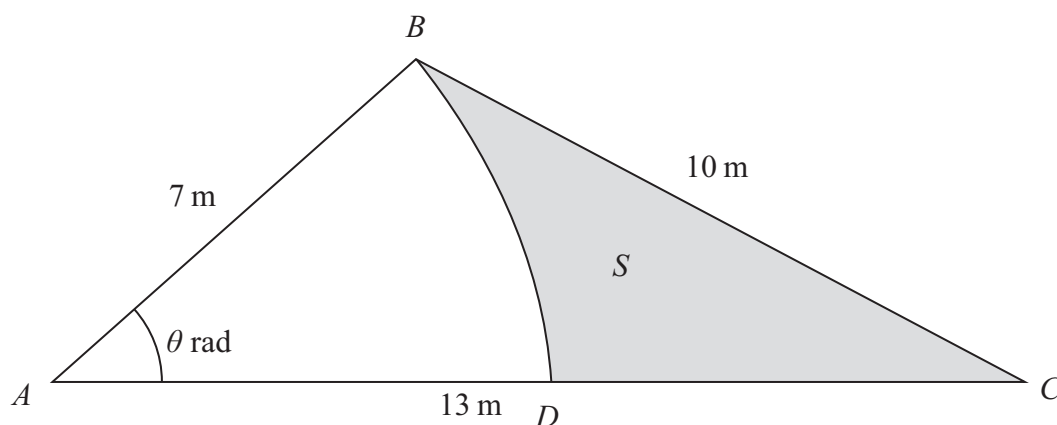


Figure 2

Figure 2 shows the design for a triangular garden ABC where $AB = 7$ m, $AC = 13$ m and $BC = 10$ m.

Given that angle $BAC = \theta$ radians,

- (a) show that, to 3 decimal places, $\theta = 0.865$ (3)

The point D lies on AC such that BD is an arc of the circle centre A , radius 7 m.

The shaded region S is bounded by the arc BD and the lines BC and DC . The shaded region S will be sown with grass seed, to make a lawned area.

Given that 50 g of grass seed are needed for each square metre of lawn,

- (b) find the amount of grass seed needed, giving your answer to the nearest 10 g. (7)







