5.

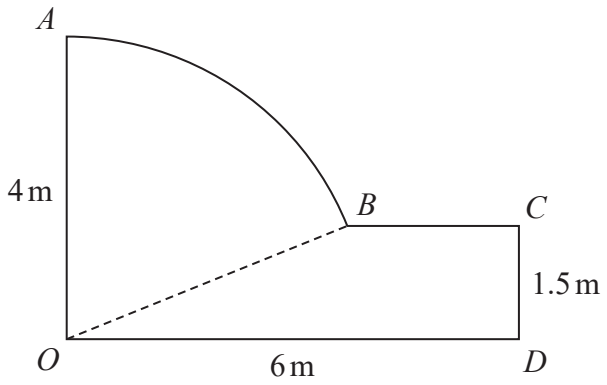

Figure 1

Figure 1 shows the plan for a garden.

In the plan

- *OA* and *CD* are perpendicular to *OD*
- *AB* is an arc of the circle with centre *O* and radius 4 metres
- *BC* is parallel to *OD*
- *OD* is 6 metres, *OA* is 4 metres and *CD* is 1.5 metres

(a) Show that angle *AOB* is 1.186 radians to 4 significant figures.

(2)

(b) Find the perimeter of the garden, giving your answer in metres to 3 significant figures.

(4)

(c) Find the area of the garden, giving your answer in square metres to 3 significant figures.

(4)

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Question 5 continued

Question 5 continued

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Question 5 continued

(Total for Question 5 is 10 marks)

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6. **In this question you must show all stages of your working.**

Solutions relying on calculator technology are not acceptable.

(a) Expand and simplify

$$\left(r - \frac{1}{r}\right)^2$$

(2)

(b) Express $\dfrac{1}{3 + 2\sqrt{2}}$ in the form $p + q\sqrt{2}$ where p and q are integers.

(2)

(c) Use the results of parts (a) and (b), or otherwise, to show that

$$\sqrt{3 + 2\sqrt{2}} - \frac{1}{\sqrt{3 + 2\sqrt{2}}} = 2$$

(3)

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