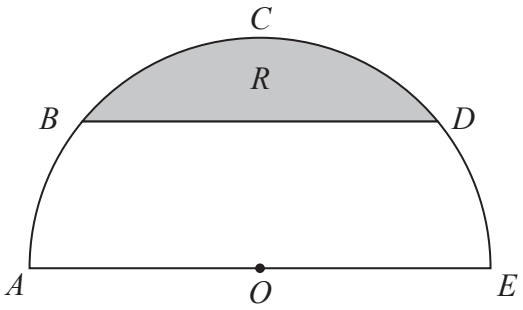
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Not to scale

Figure 2

Figure 2 shows a plan view of a semicircular garden *ABCDEOA*

The semicircle has

- centre *O*
- diameter *AOE*
- radius 3 m

The straight line *BD* is parallel to *AE* and angle *BOA* is 0.7 radians.

(a) Show that, to 4 significant figures, angle *BOD* is 1.742 radians.

(1)

The flowerbed *R*, shown shaded in Figure 2, is bounded by *BD* and the arc *BCD*.

(b) Find the area of the flowerbed, giving your answer in square metres to one decimal place.

(3)

(c) Find the perimeter of the flowerbed, giving your answer in metres to one decimal place.

(3)

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Question 5 continued

Q5

(Total 7 marks)

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6. The curve C has equation $y = f(x)$ where $x > 0$

Given that

- $f'(x) = \dfrac{(x+3)^2}{x\sqrt{x}}$
- the point $P(4, 20)$ lies on C

(a) (i) find the value of the gradient at P

(ii) Hence find the equation of the tangent to C at P, giving your answer in the form $ax + by + c = 0$ where a, b and c are integers to be found.

(4)

(b) Find $f(x)$, simplifying your answer.

(7)

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