8.

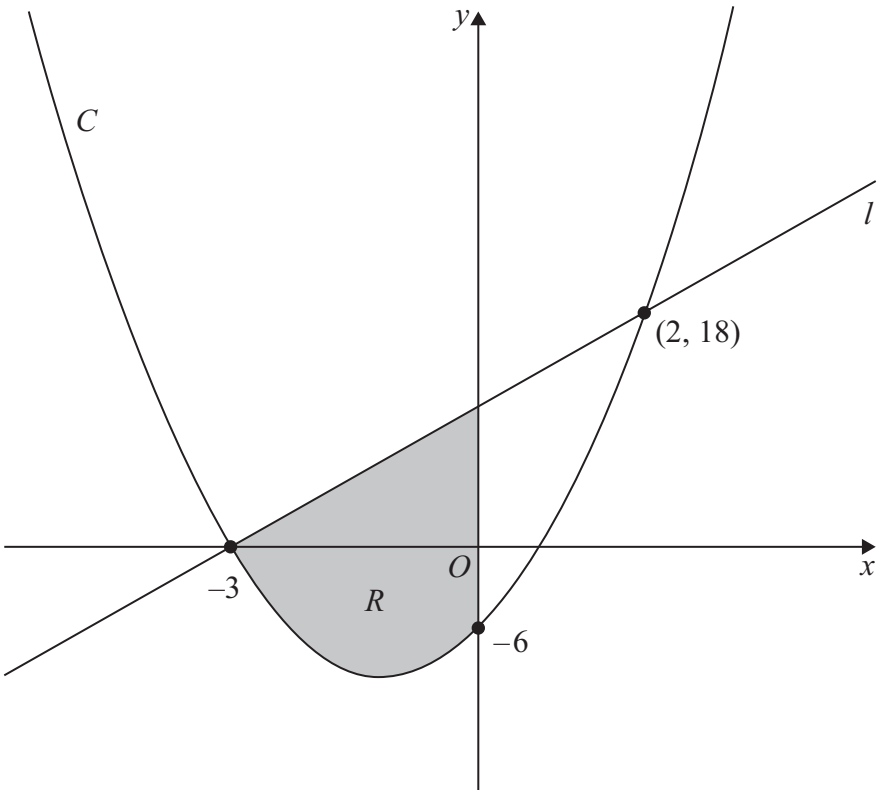

Figure 3

Figure 3 shows a sketch of a line l and a quadratic curve C.

Given that l passes through $(-3, 0)$ and $(2, 18)$

(a) find an equation for l in the form $y = mx + c$ where m and c are constants.

(3)

Given that

- C and l intersect at the points $(-3, 0)$ and $(2, 18)$
- C crosses the y-axis at $(0, -6)$

(b) find an equation for C.

(4)

The region R, shown shaded in Figure 3, is bounded by C, l and the y-axis.

(c) Use inequalities to define R.

(2)

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Question 8 continued

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Question 8 continued

(Total for Question 8 is 9 marks)

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9.

Diagram NOT to scale

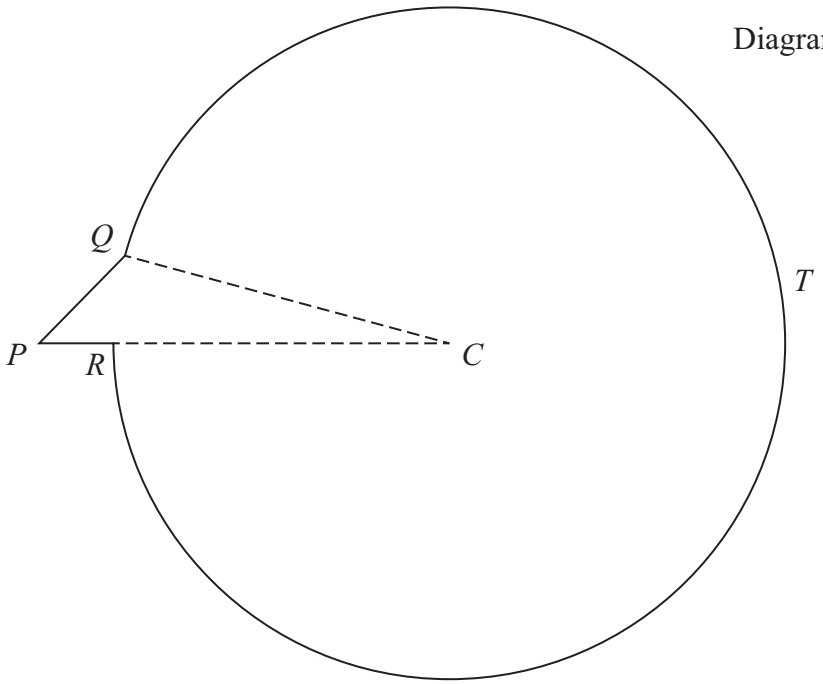

Figure 4

Figure 4 shows the outline of a sign that is used to advertise a bird sanctuary.

The sign is composed of a triangle CPQ joined to a sector $QCRTQ$ of a circle, centre C.

Given that

- angle $QPR = 0.8$ radians
- $PQ = 0.5\,\text{m}$
- $PC = 1.84\,\text{m}$
- PRC is a straight line

(a) find the radius, CQ, of the sector, in metres to 3 decimal places.

(2)

(b) Hence show that angle PCQ is 0.236 radians to 3 decimal places.

(2)

(c) Find the total area of the sign, giving your answer in m^2 to one decimal place.

(3)

(d) Find the total perimeter of the sign, giving your answer in metres to one decimal place.

(2)

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