9: The circle C

- has a centre which lies on the x-axis
- touches the y-axis
- passes through the point (5, 6)

(a) On Diagram 1, sketch a graph of C.

(1)

(b) Find an equation for C.

(4)

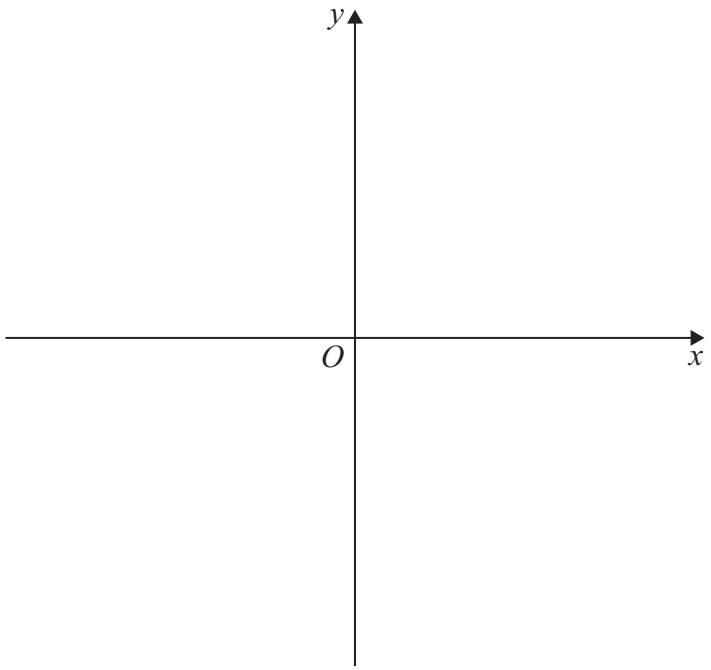

Diagram 1

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Question 9 continued

(Total for Question 9 is 5 marks)

10:

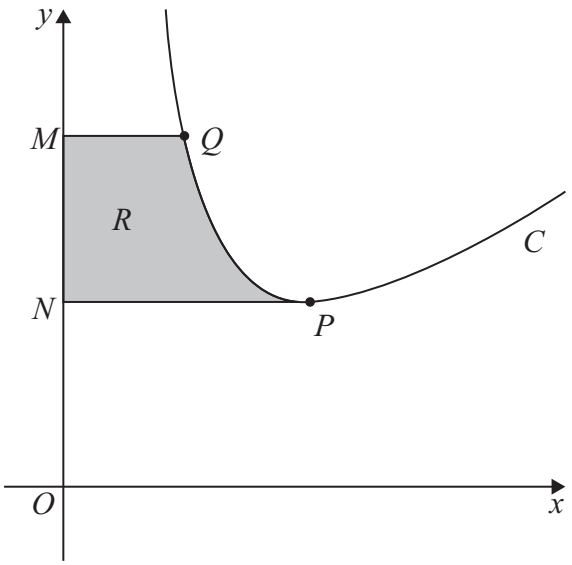

Figure 3

In this question you must show all stages of your working.
Solutions relying entirely on calculator technology are not acceptable.

Figure 3 shows a sketch of the curve C with equation

$$y = 2x + \frac{64}{x^2} - 3 \qquad x > 0$$

The point P, shown in Figure 3, is the stationary point on C.

(a) Show, using calculus, that the x coordinate of P is 4

(4)

The point Q lies on C and has x coordinate 2

The line segments MQ and NP, shown in Figure 3, are parallel to the x-axis.

The region R, shown shaded in Figure 3, is bounded by C, the y-axis and line segments MQ and NP.

(b) Use algebraic integration to find the exact area of R.

You must make your method clear.

(5)

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