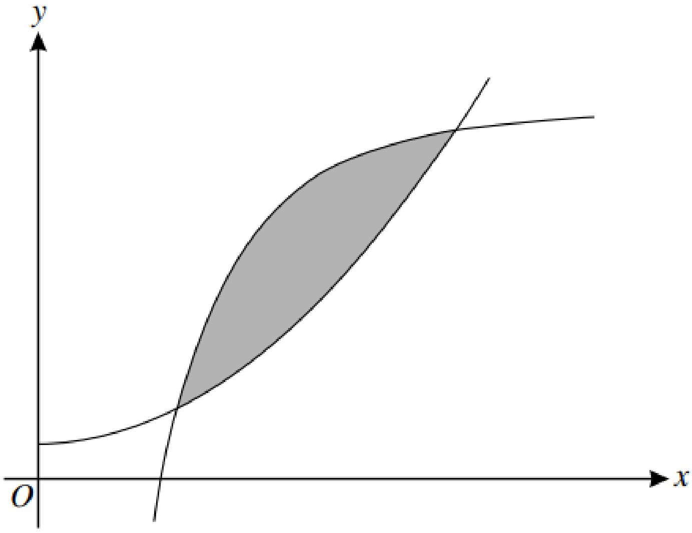
Areas Involving Two Curves

Q1, (OCR 4722, Jan 2010, Q5)

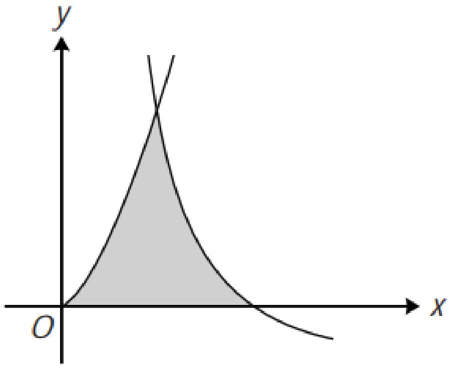


The diagram shows parts of the curves $y = x^2 + 1$ and $y = 11 - \frac{9}{x^2}$, which intersect at (1, 2) and (3, 10). Use integration to find the exact area of the shaded region enclosed between the two curves. **[7]**

Q2, (OCR 4722, Jan 2012, Q7)

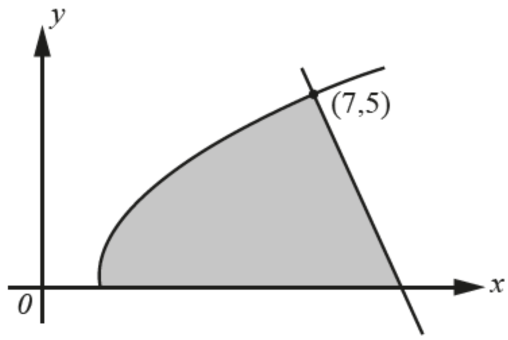
(a) Find $\int (x^2 + 4)(x - 6)\,dx$. **[3]**

(b)



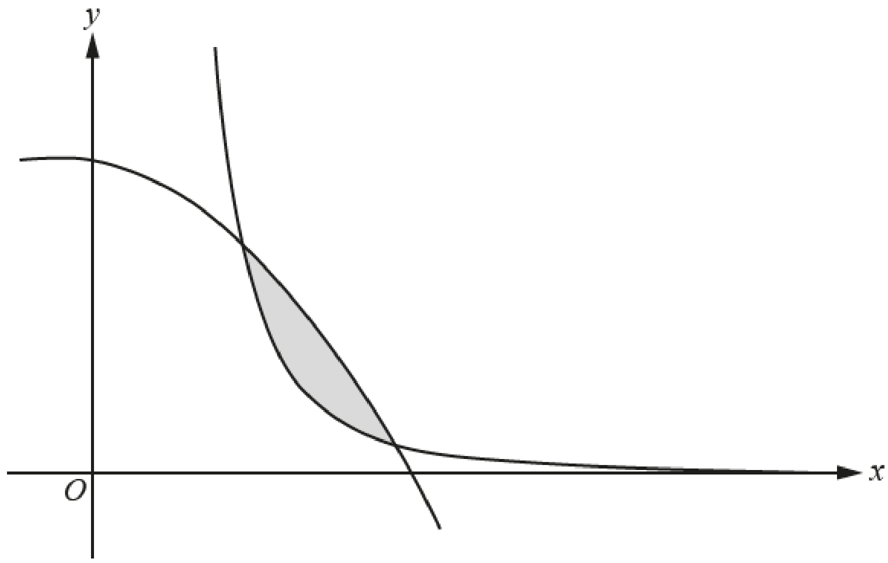
The diagram shows the curve $y = 6x^{\frac{3}{2}}$ and part of the curve $y = \frac{8}{x^2} - 2$, which intersect at the point (1, 6). Use integration to find the area of the shaded region enclosed by the two curves and the x-axis. **[8]**

Q3, (OCR 4723, Jun 2017, Q5)



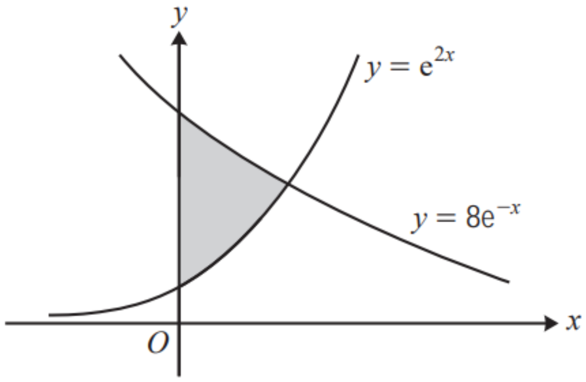
The diagram shows the curve $y = \sqrt{4x-3}$ and the normal to the curve at the point $(7,5)$. The shaded region is bounded by the curve, the normal and the x-axis. Find the exact area of the shaded region. **[8]**

Q4, (OCR 4722, Jun 2017, Q6)



The diagram shows parts of the curves $y = 11 - x - 2x^2$ and $y = \dfrac{8}{x^3}$. The curves intersect at (1, 8) and (2, 1). Use integration to find the exact area of the shaded region enclosed between the two curves. **[7]**

Q5, (OCR 4723, Jun 2016, Q5)



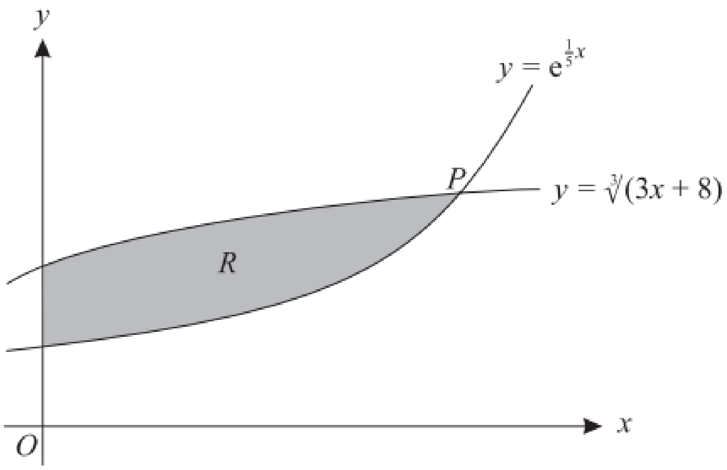
The diagram shows the curves $y = e^{2x}$ and $y = 8e^{-x}$. The shaded region is bounded by the curves and the y-axis. Without using a calculator,

(i) solve an appropriate equation to show that the curves intersect at a point for which $x = \ln 2$, **[2]**

(ii) find the area of the shaded region, giving your answer in simplified form. **[5]**

Q6, (OCR 4723, Jun 2005, Q8)

Note: This question needs some knowledge of iterative methods for solving equations.



The diagram shows part of each of the curves $y = e^{\frac{1}{5}x}$ and $y = \sqrt[3]{(3x+8)}$. The curves meet, as shown in the diagram, at the point P. The region R, shaded in the diagram, is bounded by the two curves and by the y-axis.

(i) Show by calculation that the x-coordinate of P lies between 5.2 and 5.3. [3]

(ii) Show that the x-coordinate of P satisfies the equation $x = \frac{5}{3}\ln(3x+8)$. [2]

(iii) Use an iterative formula, based on the equation in part **(ii)**, to find the x-coordinate of P correct to 2 decimal places. [3]

(iv) Use integration, and your answer to part **(iii)**, to find an approximate value of the area of the region R. [5]