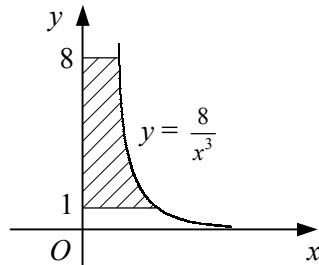


- 1 a Find the coordinates of the points where the curve $x = 6y - y^2$ crosses the y -axis.
 b Sketch the curve $x = 6y - y^2$.
 c Find the area of the region enclosed by the curve $x = 6y - y^2$ and the y -axis.

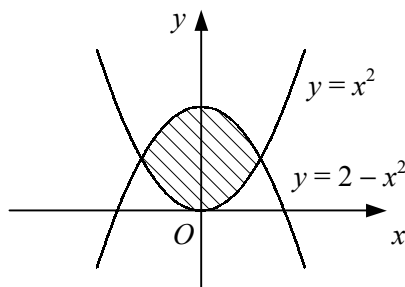
2



The diagram shows the curve with the equation $y = \frac{8}{x^3}$, $x > 0$.

- a Write the equation of the curve in the form $x = f(y)$.
 b Show that the area of the shaded region enclosed by the curve, the lines $y = 1$ and $y = 8$ and the y -axis is 9.

3



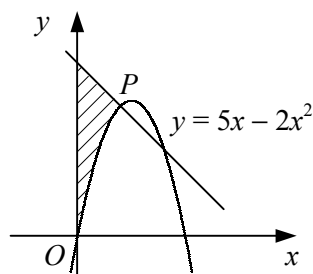
The diagram shows the curves with the equations $y = x^2$ and $y = 2 - x^2$.

- a Find the coordinates of the points where the curves intersect.
 b Show that the area of the shaded region enclosed by the two curves is given by

$$\int_{-1}^1 (2 - 2x^2) \, dx.$$

- c Hence find the area of the shaded region.

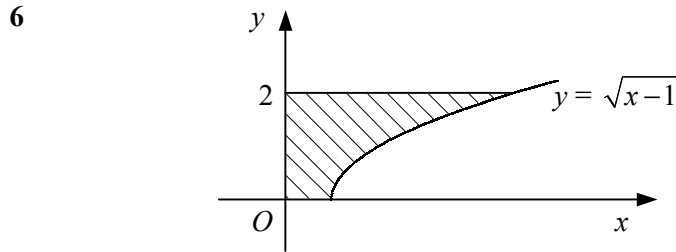
4



The diagram shows the curve $y = 5x - 2x^2$ and the normal to the curve at the point $P(1, 3)$.

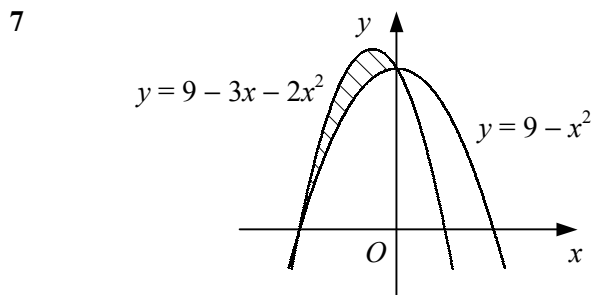
- a Find an equation of the normal to the curve at P .
 The shaded region is bounded by the curve, the normal to the curve at P and the y -axis.
 b Show that the area of the shaded region is $\frac{5}{3}$.

- 5 $f(x) \equiv 3 + 4x - x^2$.
- Express $f(x)$ in the form $a(x + b)^2 + c$, stating the values of the constants a , b and c .
 - State the coordinates of the turning point of the curve $y = f(x)$.
 - Find the area of the region enclosed by the curve $y = f(x)$ and the line $y = 3$.



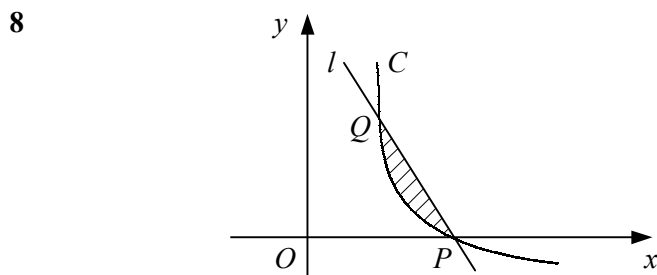
The diagram shows the curve with the equation $y = \sqrt{x-1}$.

- Find an equation of the curve in the form $x = f(y)$.
- The shaded region is bounded by the curve, the coordinate axes and the line $y = 2$.
- Show that the area of the shaded region is $4\frac{2}{3}$.



The diagram shows the curves with the equations $y = 9 - 3x - 2x^2$ and $y = 9 - x^2$.

- Show that the area of the shaded region enclosed by the two curves is given by
$$\int_k^0 (-3x - x^2) dx,$$
 where k is an integer to be found.
- Hence find the area of the shaded region.



The diagram shows the curve C with the equation $y = \frac{4-x^2}{x^2}$, $x > 0$, and the straight line l .

- Find the coordinates of the point P where C crosses the x -axis.
- The line l has gradient -3 and intersects C at the points P and Q .
- Find the coordinates of the point Q .
 - Show that the area of the shaded region enclosed by C and l is $\frac{1}{2}$.