

- 4 In each case the region enclosed between the following curves and the  $x$ -axis is rotated through  $360^\circ$  about the  $x$ -axis. Find the volume of the solid generated.
- (a)  $y = (x+1)(x-3)$  (b)  $y = 1 - x^2$   
(c)  $y = x^2 - 5x + 6$  (d)  $y = x^2 - 3x$
- 5 The region enclosed between the graphs of  $y = x$  and  $y = x^2$  is denoted by  $R$ . Find the volume generated when  $R$  is rotated through  $360^\circ$  about
- (a) the  $x$ -axis, (b) the  $y$ -axis.
- 6 The region enclosed between the graphs of  $y = 4x$  and  $y = x^2$  is denoted by  $R$ . Find the volume generated when  $R$  is rotated through  $360^\circ$  about
- (a) the  $x$ -axis, (b) the  $y$ -axis.
- 7 The region enclosed between the graphs of  $y = \sqrt{x}$  and  $y = x^2$  is denoted by  $R$ . Find the volume generated when  $R$  is rotated through  $360^\circ$  about
- (a) the  $x$ -axis, (b) the  $y$ -axis.
- 8 A glass bowl is formed by rotating about the  $y$ -axis the region between the graphs of  $y = x^2$  and  $y = x^3$ . Find the volume of glass in the bowl.
- 9 The region enclosed by both axes, the line  $x = 2$  and the curve  $y = \frac{1}{8}x^2 + 2$  is rotated about the  $y$ -axis to form a solid. Find the volume of this solid.

### Miscellaneous exercise 17

- 1 The region bounded by the curve  $y = x^2 + 1$ , the  $x$ -axis, the  $y$ -axis and the line  $x = 2$  is rotated completely about the  $x$ -axis. Find, in terms of  $\pi$ , the volume of the solid formed.

