

- 6 The line  $y = 3x - 9$  intersects the curve  $49x^2 - y^2 + 42x + 8y = 247$  at the points  $A$  and  $B$ . Find the length of the line  $AB$ . [7]
- 6 The line  $y = x + 4$  intersects the curve  $x^2 + 3xy - y^2 + 1 = 0$  at the points  $A$  and  $B$ . Find the length of the line  $AB$ . [7]
- 8 The equation of the curve  $C$  is  $2y = x^2 + 4$ . The equation of the line  $L$  is  $y = 3x - k$ , where  $k$  is an integer.
- (i) Find the largest value of the integer  $k$  for which  $L$  intersects  $C$ . [4]
- (ii) In the case where  $k = -2$ , show that the line joining the points of intersection  $A$  and  $B$  of  $L$  and  $C$  is bisected by the line  $y = 2x + 5$ . [4]
- 1 Find the coordinates of the points of intersection of the curve  $y = 10x - 8x^2$  and the straight line  $y + 4x + 1 = 0$ . [5]
- 3 The line  $y = 3x + k$  is a tangent to the curve  $x^2 + xy + 16 = 0$ .
- (i) Find the possible values of  $k$ . [3]
- (ii) For each of these values of  $k$ , find the coordinates of the point of contact of the tangent with the curve. [2]