

- 1 Reduce  $2x^2 - 11x + 10$  to the form  $a(x+h)^2 + k$ . [4]
- 2 Find the nature of the roots of the equation  
$$-64 + 6x - x^2 = 0$$
 [4]
- 3 Solve the quadratic inequality  $144 - x^2 \leq 0$  [4]
- 4 Sketch the graph of  $y = -2x^2 + 8x - 17$  [5]
- 5 Solve the simultaneous equations  
$$3x + 2y = -5$$
$$3x^2 + y^2 + 7x - 3y = 0$$
 [5]
- 6 Find the inverse of  $f : x \mapsto x^2 - 2x + 5, x \in \mathfrak{R}, x \geq 1$  [5]
- 7 (a) Find the values of  $k$  for which the equation  $3x^2 + kx + 12 = 0$  has equal roots. [3]  
(b) Find the values of  $k$  for which the equation  $x(3x - 2) + kx + 12 = 0$  has no real roots in  $x$ . [4]
- 8 Sketch the graph of  $f : x \mapsto \cos x, x \in \mathfrak{R}, \frac{-\pi}{2} \leq x \leq \frac{\pi}{2}$ . [3]  
Find its range and determine whether the function is one-one. [4]
- 9 Solve the following equations:  
(a)  $3 \times 3^{2x} - 4 \times 3^x + 1 = 0$  [4]  
(b)  $(2^{2x} + 1)^4 - 5(2^{2x} + 1)^2 + 6 = 0$  [5]