3. Find the set of values of x for which

   (a) $4x - 5 > 15 - x$

   (2)

   (b) $x(x - 4) > 12$

   (4)

2. Find the set of values of x for which

$$x^2 - 7x - 18 > 0.$$

(4)

8. The equation $x^2 + 2px + (3p + 4) = 0$, where p is a positive constant, has equal roots.

(a) Find the value of p.

(4)

(b) For this value of p, solve the equation $x^2 + 2px + (3p + 4) = 0$.

(2)

9. Given that $f(x) = (x^2 - 6x)(x - 2) + 3x$,

   (a) express $f(x)$ in the form $x(ax^2 + bx + c)$, where a, b and c are constants.

                                                      (3)

   (b) Hence factorise $f(x)$ completely.

                                                      (2)

   (c) Sketch the graph of $y = f(x)$, showing the coordinates of each point at which the graph meets the axes.

                                                      (3)

8. Given that the equation $2qx^2 + qx - 1 = 0$, where q is a constant, has no real roots,

(a) show that $q^2 + 8q < 0$.

(2)

(b) Hence find the set of possible values of q.

(3)

8. The equation

$$x^2 + kx + 8 = k$$

has no real solutions for x.

(a) Show that k satisfies $k^2 + 4k - 32 < 0$.

(3)

(b) Hence find the set of possible values of k.

(4)

7. The equation $kx^2 + 4x + (5 - k) = 0$, where k is a constant, has 2 different real solutions for x.

(a) Show that k satisfies
$$k^2 - 5k + 4 > 0.$$

(3)

(b) Hence find the set of possible values of k.

(4)

5. The equation $2x^2 - 3x - (k+1) = 0$, where k is a constant, has no real roots.

Find the set of possible values of k.

(4)

(Total 4 marks)

Question 6 continued

(Total 7 marks)

7. The equation $x^2 + kx + (k+3) = 0$, where k is a constant, has different real roots.

(a) Show that $k^2 - 4k - 12 > 0$.

(2)

(b) Find the set of possible values of k.

(4)