Chapter End Test

Ch (1) & (2)

1. $f(x) = (2x + 3)^2$ for x > 0
   a. Find the range of f. [1]
   b. Find $f^{-1}(x)$. [3]
   c. State the domain of f^{-1}. [1]
   d. Find $ff(1)$. [2]

2. (a) Write $2x^2 + 3x - 4$ in the form $a(x + b)^2 + c$, where a, b and c are constants. [3]

(b) Hence, write down the coordinates of the stationary point on the curve $y = 2x^2 + 3x - 4$. [2]

(c) Sketch the graph of $y = |2x^2 + 3x - 4|$, showing the exact values of the intercepts of the curve with the coordinate axes. [3]

(d) Find the value of k for which $\left|2x^2 + 3x - 4\right| = k$ has exactly 3 values of x. [1]

3. Find the value of k for which the line $y = kx - 7$ and the curve $y = 3x^2 + 8x + 5$ do not intersect. [6]

4. Find the set of values of k for which $4x^2 - 4kx + 2k + 3 = 0$ has no real roots. [5]

5. Solve the equations

$$y - x = 4,$$
$$x^2 + y^2 - 8x - 4y - 16 = 0.$$

[5]

6. (i) Sketch the graph of $y = |4x - 2|$ on the axes, showing the coordinates of the points where the graph meets the axes. [3]

(ii) Solve the equation $|4x - 2| = x$. [3]