1. Find the equation of the line passing through the point $(-4, 0)$ and through the point of intersection of the lines $2x - y + 1 = 0$ and $3x + y - 16 = 0$. Write your answer in the form $y = mx + c$. (5.5)

2. Suppose (a, b) is a point on the graph of $y = f(x)$. Give, in terms of a and b, the co-ordinates obtained by the following transformations:
   (a) $f(x + 1)$
   (b) $f(x) + 1$
   (c) $f(x - 1) + 1$
   (d) $f^{-1}(x)$ (8)

3. Find the domain of the function $f(x) = \sqrt{x} + \sqrt{3 - 2x}$. Give your answer in interval notation. (4)

4. For $p(x) = -x^2 + 3$, $q(x) = (x + 1)^2$:
   a) Sketch, on the axes provided:
   $$A = \{(x, y) \in R^2 \mid y \geq p(x)\} \cap \{(x, y) \in R^2 \mid y > q(x)\}$$ (4)
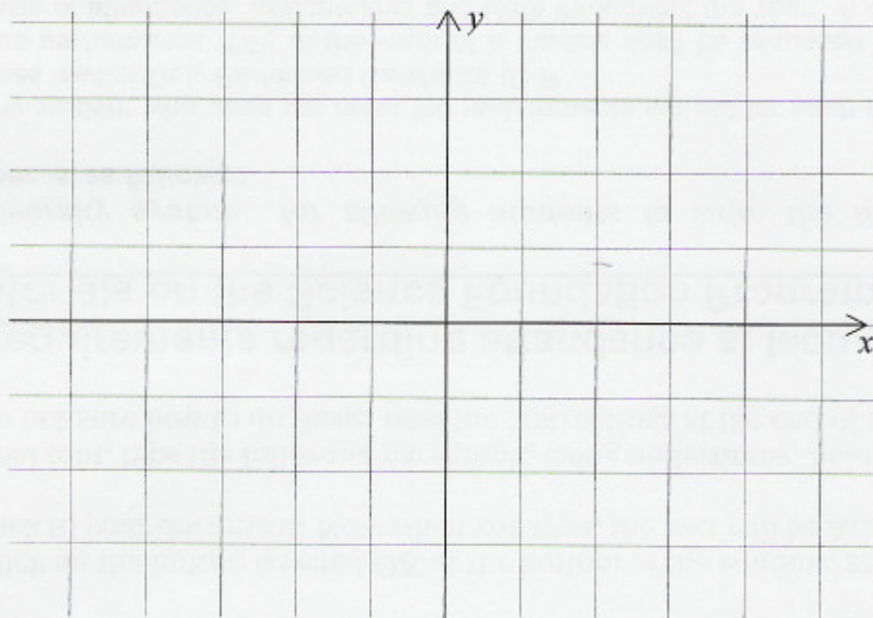
   b) Give the domain of A in interval notation. (1)
   c) Find $(p \circ q)(2)$ (2.5)
   [7.5]

5. The inverse of the greatest restriction of a quadratic function is given by $y = 2 - \sqrt{x - 3}$.
   Find:
   a) The equation of the original quadratic function. (3)
   b) The restriction which has the inverse given above. (2.5)
   [5.5]

6. A circle has domain [-4, 2] and range [2, p].
        a) Determine the radius of the circle.   (1)
        b) Determine the value(s) of p.   (1)
        c) Determine the co-ordinates of the centre of the circle.   (2)
        d) Write down the equation of the circle in the form

$$(x-a)^2 + (y-b)^2 = r^2$$ (1.5)

                                                              [5.5]

7. Consider $m(x) = x - 1$ and $p(x) = \dfrac{3}{x}$. Sketch the graph of $(p \circ m)(x)$.

Clearly label asymptotes and any points plotted.   (4)