Section 2: Completing the square

Exercise

1. Write each of the following quadratic functions in the form $(x + b)^2 + c$:
   (i) $x^2 + 2x - 3$ (ii) $x^2 - 6x + 1$
   (iii) $x^2 + x + 1$ (iv) $x^2 - 3x + 4$

2. Write each of the following quadratic functions in the form $a(x + b)^2 + c$:

   (i) $3x^2 + 6x + 2$ (ii) $-x^2 + 5x$
   (iii) $2x^2 + 4x + 3$ (iv) $3x^2 + 8x - 2$

3. Work out the values of p, q and r in the following

   $$6 - 12x - 3x^2 = p - q(x + r)^2$$

4. Work out the values of a, b and c such that

   $$8 + bx - 4x^2 = c - a(x - 2)^2.$$

5. Show that $x^2 - 4x + 8 = (x - 2)^2 + 4$.
   Hence make x the subject of the formula $y = x^2 - 4x + 8$

6. Make x the subject of the formula $y = 3x^2 + 8x - 3$