Completing the Square : 3

1) Solve these equations by completing the square, giving your answers to 2 d.p.

a) $x^2 + 4x - 1 = 0$

b) $x^2 - 2x - 8 = 0$

c) $x^2 + 3x - 2 = 0$

d) $2x^2 - 6x + 4 = 0$

e) $2x^2 + 9x - 1 = 0$

2) For the formula or quadratic equation $ax^2 + bx + c = 0$ where a, b, c are constants, show that

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

by using completing the square methods.

3) Sketch the following quadratic graphs, clearly indicating the position of max and min points.

a) $y = x^2 + 2x + 3$

b) $y = x^2 - 3x - 1$

c) $y = -x^2 + x + 2$

d) $y = 2x^2 - 4x + 1$

e) $y = -2x^2 + 3x - 1$

f) $y = 3x^2 - 5x + 2$