Quadratics : Completing the Square : 5

1) Express x^2+8x+2 in the form $(x+a)^2+b$. Hence write down the least value of x^2+8x+2.

2) Express x^2+4x+9 in the form $(x+a)^2+b$ where the values of a and b are to be determined.
Deduce the maximum value of

$$\frac{1}{x^2+4x+9}$$

3) Express $2x^2+4x+5$ in the form $a(x+b)^2+c$ where a, b and c are to be determined.

Use the result above to find, by use of a graph to help, the greatest value of

$$\frac{1}{2x^2+4x+9}$$

4) Show that $x^2+1{\cdot}8x-3{\cdot}19$ can be expressed in the form $(x+p)^2-4$ where p is a constant whose value is to be found.

Hence solve the quadratic equation

$$x^2+1{\cdot}8x-3{\cdot}19=0$$

5) Express x^2+6x-4 in the form $(x+a)^2+b$ where values of a and b are to be found.

Use your results to find the least value of $2x^2+12x-8$ and find the corresponding value of x.

6) Express $3x^2-12x+17$ in the form $a(x+b)^2+c$ where a, b and c need to be found.

Hence sketch $y=3x^2-12x+17$, indicating the coordinates of its stationary point.

7) Express x^2-5x+8 in the form $(x+a)^2+b$.

Deduce the greatest value of $-x^2+5x-8$