**4.4 – THE QUADRATIC FORMULA**

Any quadratic equation can be written in general form : $ax^{2}+bx+c=0$.

The sign of the **discriminant** $Δ$ of a quadratic expression tells us the number of zeros that it has.

$$Δ=b^{2}-4ac$$

Property: If $Δ>0$, the expression has 2 distinct real roots.

 If $Δ=0$, the expression has 1 double real root.

 If $Δ<0$, the expression has no real root.

Examples: Determine the number of solutions of the following equations:
a) $-2x^{2}+3x+8=0$ b) $3x^{2}-5x=-9$ c) $\frac{1}{4}x^{2}-3x+9=0$

The values of the roots are given by the **quadratic formula**:

$$x=\frac{-b\pm \sqrt{Δ}}{2a}$$

Examples : a) $x^{2}+5x+6=0$

 b) $x^{2}-3x-2=0$

 c) $-5x^{2}+x-3=x-4$

Note: If the discriminant is a perfect square, the roots will be rational. It also means that you could have solved by factoring.

Hwk : p 254 # 2, 3, 5, 7, 9, 10, 12, 14, 15, 17 – 20.