Quadratic Equation

$$ax^2 + bx + c = 0 \; ; \quad a, b, c \in R \text{ and } a \neq 0$$

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

$$\text{Discriminant} = D = b^2 - 4ac$$

(i) if $D > 0$; roots are distinct and real.

ii) If $D = 0$; roots are Equal and real

iii) if $D < 0$; roots are imaginary (complex roots)

* $ax^2 + bx + c = 0$

if α and β are roots of equation

then

Sum of roots ; $\left[\alpha + \beta = -\dfrac{b}{a} \right]$

Product of roots; $\left[\alpha\beta = \dfrac{c}{a} \right]$

So; $\left[x^2 - (\alpha + \beta)x + \alpha\beta = 0 \right]$