

FORMULAE – Quadratic Functions

- **The Quadratic Formula**

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

- **Sum and Product of the Roots of an Equation**

$$\alpha + \beta = \frac{-b}{a}$$

$$\alpha\beta = \frac{c}{a}$$

- **Axis of symmetry of a Parabola**

$$x = \frac{-b}{2a}$$

- **The Discriminant**

$$\Delta = b^2 - 4ac$$

- **Types of Roots**

- **Real Roots**
 $\Delta \geq 0$
- **Unreal Roots**
 $\Delta \leq 0$
- **Equal Roots**
 $\Delta = 0$
- **Rational Roots**
 Δ is a perfect square
- **Irrational Roots**
 Δ is not a perfect square

- **Definiteness**

- **Positive Definite**
 $a > 0, \Delta < 0$
- **Negative Definite**
 $a < 0, \Delta < 0$
- **Indefinite**
 $\Delta \geq 0$