Maths Notes November 17, 2024

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$$O = x^2 + bx + c \quad \text{(Define the quadratic equation)} \tag{1}$$

$$O = \left(x + \frac{b}{2}\right)^2 - \left(\frac{b}{2}\right)^2 + c \quad \text{(Completing the square)} \tag{2}$$

$$\frac{4c - b^2}{4} = -\left(x + \frac{b}{2}\right)^2 \quad \text{(Rearranging terms)} \tag{3}$$

$$x = \frac{b}{2} \pm \sqrt{\frac{b^2 - 4c}{4}} \quad \text{(Solving for } x) \tag{4}$$

$$x = -\frac{b}{2} \pm \frac{\sqrt{4c - b^2}}{2} \quad \text{(Simplifying the square root)} \tag{5}$$