

# The Method of Completing the Square

Example: Solve  $2x^2 + 3x - 1 = 0$

$$2x^2 + 3x - 1 = 0$$

$$2x^2 + 3x = 1$$

$$\frac{2x^2}{2} + \frac{3x}{2} = \frac{1}{2}$$

$$\therefore x^2 + \frac{3}{2}x = \frac{1}{2}$$

$$x^2 + \frac{3}{2}x + \left(\frac{3}{4}\right)^2 = \frac{1}{2} + \left(\frac{3}{4}\right)^2$$

Now this becomes a complete square!

Simplify:  $\frac{1}{2} + \frac{9}{16} = \frac{17}{16}$

$$\therefore \left(x + \frac{3}{4}\right)^2 = \frac{17}{16}$$

Take the square root of both sides:

$$\therefore x + \frac{3}{4} = \pm \sqrt{\frac{17}{16}}$$

$$x + \frac{3}{4} = \pm \frac{\sqrt{17}}{4}$$

$$x = -\frac{3}{4} \pm \frac{\sqrt{17}}{4}$$

$$\therefore x = \frac{-3 \pm \sqrt{17}}{4}$$

DONE