

Quadratic Formula Example

Solve for x: $25x^2 = 10x + 2$.

Solution: Write in standard form:

$$25x^2 - 10x - 2 = 0$$

Then, by the Quadratic Formula,

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

where

$$a = 25$$

$$b = -10$$

$$c = -2$$

$$= \frac{-(-10) \pm \sqrt{(-10)^2 - 4(25)(-2)}}{2(25)}$$

$$= \frac{10 \pm \sqrt{100 + 200}}{50}$$

$$= \frac{10 \pm \sqrt{100(1+2)}}{50}$$

$$= \frac{10 \pm \sqrt{(100)(3)}}{50}$$

$$= \frac{10 \pm \sqrt{100} \sqrt{3}}{50}$$

$$= \frac{10 \pm 10\sqrt{3}}{50}$$

$$= \frac{10 [1 \pm \sqrt{3}]}{10 \cdot 5}$$

$$= \frac{1 \pm \sqrt{3}}{5} \quad \blacksquare$$