

$$ax^2 + bx + c = 0 \quad \text{General Form of a quadratic equation}$$

$$ax^2 + bx + \overbrace{c}^{-c} = \overbrace{0}^{-c}$$

$$\frac{ax^2}{a} + \frac{bx}{a} = \frac{-c}{a}$$

$$x^2 + \frac{b}{a}x = \frac{-c}{a}$$

$$x^2 + \frac{b}{a}x + \frac{b^2}{4a^2} = \frac{-c}{a} + \frac{b^2}{4a^2}$$

$$\left(x + \frac{b}{2a}\right)^2 = \frac{-c}{a} \cdot \frac{4a}{4a} + \frac{b^2}{4a^2}$$

$$\left(x + \frac{b}{2a}\right)^2 = \frac{-4ac}{4a^2} + \frac{b^2}{4a^2}$$

$$\left(x + \frac{b}{2a}\right)^2 = \frac{b^2 - 4ac}{4a^2}$$

"Texas 2 Step"

$$\left(\frac{b}{a} \cdot \frac{1}{2}\right)^2$$

$$\sqrt{\left(x + \frac{b}{2a}\right)^2} = \sqrt{\frac{b^2 - 4ac}{4a^2}}$$

$$\left|x + \frac{b}{2a}\right| = \frac{\sqrt{b^2 - 4ac}}{2a}$$

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

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

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

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

Quadratic
Formula

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

$a \neq 0$

EX1 solve: $3x^2 + x - 1 = 0$

$a = 3$ $b = 1$ $c = -1$

$$x = \frac{-1 \pm \sqrt{1^2 - 4(3)(-1)}}{2(3)}$$

$$x = \frac{-1 \pm \sqrt{1+12}}{6}$$

$$x = \frac{-1 \pm \sqrt{13}}{6}$$

EX2 $5y^2 = 6y - 3$
 $-6y + 3$ $-6y + 3$

$$5y^2 - 6y + 3 = 0$$

$a = 5$ $b = -6$ $c = 3$

$$x = \frac{+6 \pm \sqrt{(-6)^2 - 4(5)(3)}}{2(5)}$$

$$x = \frac{6 \pm \sqrt{36 - 60}}{10}$$

$$x = \frac{6 \pm \sqrt{-24}}{10}$$

$$x = \frac{6 \pm \sqrt{-1} \sqrt{4} \sqrt{6}}{10}$$

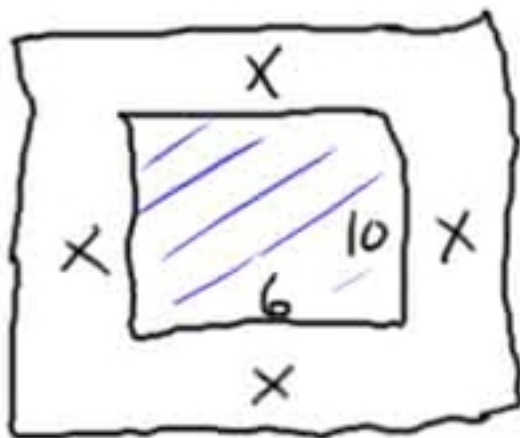
$$x = \frac{6 \pm 2i\sqrt{6}}{10}$$

$$x = \frac{\cancel{2}(3 \pm i\sqrt{6})}{\cancel{2} \cdot 5}$$

$$x = \frac{3 \pm i\sqrt{6}}{5}$$

EX3

Area Pool: 60



Area Pool & walk:

$$(2x+6)(2x+10)$$

Area Pool = Area Walk

$$60 = (2x+6)(2x+10) - 60$$

$$60 = 4x^2 + 20x + 12x + 60 - 60$$

$$60 = 4x^2 + 32x$$

$$0 = \frac{4x^2}{4} + \frac{32x}{4} - \frac{60}{4}$$

$$0 = x^2 + 8x - 15$$

$$a=1 \quad b=8 \quad c=-15$$

$$x = \frac{-8 \pm \sqrt{8^2 - 4(1)(-15)}}{2(1)}$$

$$x = \frac{-8 \pm \sqrt{64 + 60}}{2}$$

$$x = \frac{-8 \pm \sqrt{124}}{2}$$

$$x = \frac{-8 \pm \sqrt{4\sqrt{31}}}{2}$$

$$x = \frac{-8 \pm 2\sqrt{31}}{2}$$

$$x = \frac{\cancel{2}(-4 \pm \sqrt{31})}{\cancel{2}}$$

$$x = -4 + \sqrt{31} ; x = \cancel{-4 - \sqrt{31}}$$

$$x \doteq -4 + 5.6$$

$$x \doteq 1.6$$