

SOLVING QUADRATICS

- 1) Finding zeros (x-intercepts) on calculator.
- 2) Factoring
- 3) Completing the Square
- 4) Quadratic Formula

FACTORING (linFOLLing)

FULL $(x+7)(x-4) = 0$

$$x^2 - 4x + 7x - 28 = 0$$

$$\rightarrow x^2 + \underline{3x} - 28 = 0$$

$$x^2 - 8x = -12$$

$$x^2 - 8x + 12 = 0$$

$$(x-6)(x-2) = 0$$

$$-6x$$

$$-2x$$

$$x-6=0 \quad x-2=0$$

$$x=6 \quad x=2$$

Solving Quadratics

- 1) Graph & find zeros (x-int)
- ① 2) Factoring
- 3) Completing the Square
- ② 4) Quadratic Formula

$$2x^2 = 7x + 15 \quad \begin{array}{l} 1 \quad 15 \\ 3 \quad 5 \end{array}$$

$$2x^2 - 7x - 15 = 0$$

$$(2x+3)(x-5) = 0$$

$\underbrace{\hspace{10em}}_{\substack{+3x \\ -10x}}$

$$2x+3=0 \quad x-5=0$$

$$2x = -3$$

$$x = -\frac{3}{2} \quad x = 5$$

$$12x^2 + 9x - 30 = 0$$

$$3(4x^2 + 3x - 10) = 0 \quad \begin{array}{l} 10 \\ 2 \quad 5 \end{array}$$

$$3(4x-5)(x+2) = 0$$

$\underbrace{\hspace{10em}}_{\substack{-5x \\ +8x}}$

$$4x-5=0 \quad x+2=0$$

$$4x = 5$$

$$x = \frac{5}{4} \quad x = -2$$

$$4c^2 = 20c$$

$$4c^2 - 20c = 0$$

$$4c(c-5) = 0$$

$$\frac{4c}{4} = 0 \quad c-5=0$$

$$c=0 \quad c=5$$

$$x^2 - 25 = 0$$

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

$$(x+5)(x-5) = 0$$

$$x+5=0 \quad x-5=0$$

$$x=-5 \quad x=5$$

$$x^2 - 49 = (x+7)(x-7)$$

$$x^2 - 121 = (x+11)(x-11)$$

Solve

$$4(x+5)^2 + 1 = 81$$

$$\frac{4(x+5)^2}{4} = \frac{80}{4}$$

$$\sqrt{(x+5)^2} = \sqrt{20}$$

$$x+5 = \pm 2\sqrt{5}$$

$$x = -5 \pm 2\sqrt{5}$$

Roots: $-7, \frac{2}{3}$

Find eq. - Work factoring problem backwards.

$$x = -7 \quad x = \frac{2}{3}$$

$$x + 7 = 0 \quad 3x = 2$$

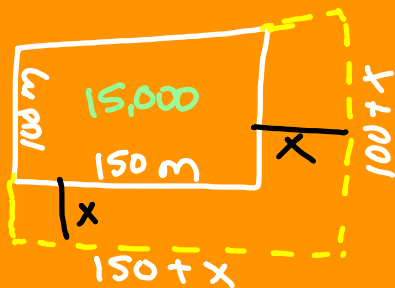
$$3x - 2 = 0$$

FOIL $(x+7)(3x-2) = 0$

$$3x^2 - 2x + 21x - 14 = 0$$

$$3x^2 + 19x - 14 = 0$$

Parking Lot - Add on to one side + one end.
 - Double existing area
 150 m
 How wide is the strip?



$$(150 + x)(100 + x) = 30,000$$

$$\begin{array}{r} 15000 + 150x + 100x + x^2 = 30,000 \\ -30,000 \\ \hline x^2 + 250x - 15000 = 0 \end{array}$$

$$(x + 300)(x - 50) = 0$$

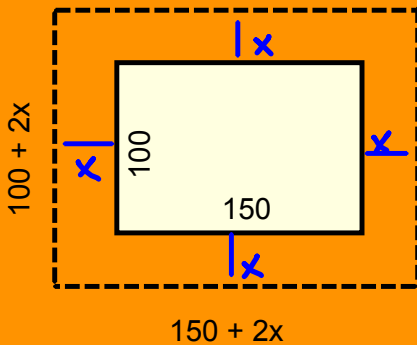
$+300x$
- $50x$

$$\begin{array}{r} 300 \cdot 50 \\ 150 \quad 100 \end{array}$$

$$x + 300 = 0 \quad x - 50 = 0$$

$$x = \cancel{-300}$$

$$x = 50 \text{ m}$$



$$(150 + 2x)(100 + 2x) = 30,000$$