

Warm-Up

★ **MULTIPLE CHOICE** The equation $17 - \frac{1}{4}x^2 = 12$ has a solution between which two integers?

Ⓐ 1 and 2

Ⓑ 2 and 3

Ⓒ 3 and 4

Ⓓ 4 and 5

$$-17 + 17 \mp \frac{1}{4}x^2 = 12 \mp 17$$

$$-4 \mp \frac{1}{4}x^2 = -5 \mp 4$$

$$\sqrt{x^2} = \sqrt{20}$$

$$x = \pm\sqrt{20}$$

4.47

-4.47

Chapter 9

Day 10

Solve Quadratic Equations by the Quadratic Formula

Factoring
Example $\square$
Corr. parts
Sh

$$Ax^2 + Bx + C = 0$$

$$X = \frac{-B \pm \sqrt{B^2 - 4AC}}{2A}$$

*We use the **Quadratic Formula** to solve any quadratic that cannot be factored and has both an x^2 and x term!

*This formula will **ALWAYS** work!

Quadratic Formula

Before substituting values for a, b, and c, rearrange your equation into the form $ax^2+bx+c=0$.

$$\boxed{A}x^2 + \boxed{B}x + \boxed{C} = 0$$

$$x = \frac{-\boxed{B} \pm \sqrt{\boxed{B}^2 - 4\boxed{A}\boxed{C}}}{2\boxed{A}}$$



Solve each equation with the quadratic formula.

$$2x^2 - 3x - 5 = 0$$

$$A = 2$$

$$B = -3$$

$$C = -5$$

$$X = \frac{-B \pm \sqrt{B^2 - 4AC}}{2A}$$

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

$$= \frac{3 \pm \sqrt{9 + 40}}{4}$$

$$= \frac{3 \pm \sqrt{49}}{4}$$

$$= \frac{3 \pm 7}{4}$$

$$X = \begin{pmatrix} \frac{10}{4} \\ \frac{-3}{2} \end{pmatrix}$$

$$\begin{aligned} & \cdot 4 \quad 4b^2 + 8b + 7 = 4 \quad \cdot 4 \\ & \quad \quad 4b^2 + 8b + 3 = 0 \end{aligned}$$

$$\begin{aligned} A &= 4 \\ B &= 8 \\ C &= 3 \end{aligned}$$

$$X = \frac{-(8) \pm \sqrt{8^2 + 4 \cdot 4 \cdot 3}}{2 \cdot 4}$$

$$= \frac{-8 \pm \sqrt{64 + 48}}{8}$$

$$= \frac{-8 \pm \sqrt{112}}{8}$$

$$\frac{-8 \pm 4}{8}$$

$$\begin{aligned} & -\frac{4}{8} \quad -\frac{12}{8} \\ & -\frac{1}{2}, -\frac{3}{2} \end{aligned}$$

$$1 \quad | \quad 5x^2 + 9x = -4 \quad | \quad +4$$

$$5x^2 + 9x + 4 = 0$$

$$A = 5$$

$$B = 9$$

$$C = 4$$

$$x = \frac{-(9) \pm \sqrt{9^2 - 4 \cdot 5 \cdot 4}}{2 \cdot 5}$$

$$\frac{-8}{10}$$

$$= \frac{-9 \pm \sqrt{81 - 80}}{10}$$

$$\frac{-9 \pm 1}{10}$$

$$x = \frac{-4}{5}, -1$$

$$\frac{-9 \pm 1}{10}$$

$$6x - 9x^2 - 11 = 6x + 6x$$

$$9x^2 - 6x - 11 = 0$$

$$A=9$$

$$B=-6$$

$$C=-11$$

$$X = \frac{-(-6) \pm \sqrt{(-6)^2 - 4 \cdot 9 \cdot (-11)}}{2 \cdot 9}$$

$$= \frac{6 \pm \sqrt{36 + 396}}{18}$$

$$-0.82$$

$$= \frac{6 \pm \sqrt{432}}{18}$$

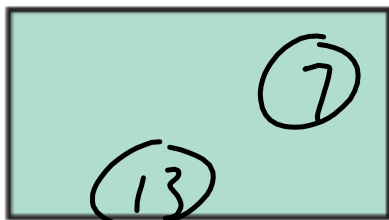
$$1.49$$

$$(6 \pm \sqrt{432}) \div 18$$

$$(6 + \sqrt{(432)}) \div 18$$

Find the dimensions of the rectangle.

$$A = 91 \text{ m}^2$$



$$(x + 2) \text{ m}$$

$$(x+2)(2x+3) = 91$$

$$2x^2 + 3x + 4x + 6 = 91$$

$$- 91 \quad - 2x^2 + 7x + 6 = 91 \quad - 91$$

$$2x^2 + 7x - 85 = 0$$

$$A = 2$$

$$B = 7$$

$$C = 85$$

$$X = \frac{-7 \pm \sqrt{7^2 - 4 \cdot 2 \cdot -85}}{2 \cdot 2}$$

$$= \frac{-7 \pm \sqrt{49 + 680}}{4}$$

$$- \frac{34}{2}$$

$$\textcircled{5} \frac{17}{2}$$

$$\cancel{-8 \frac{1}{2}}$$

$$\frac{-7 \pm \sqrt{729}}{4}$$

$$\frac{-7 + 27}{4}$$

 <https://www.youtube.com/watch?v=jGJrH49Z2ZA>