

Chapter P.8: Quadratic Equations

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

Zero Product Property:

if $AB=0$ then $A=0$ or $B=0$

Ways to Solve Quadratics:

- Factoring
- Square Root
- Completing the square
- Quadratic Formula

Solve by factoring:

$$4x^2 - 2x = 0$$

$$2x^2 + 7x = 4$$

Solve by square roots:

$$4x^2 = 20$$

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

Solve by Completing the square:

$$x^2 - 6x + 2 = 0$$

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

$$x^2 - 6x + \underline{9} = -2 + \underline{9}$$

$$\sqrt{(x - \underline{3})^2} = \sqrt{7}$$

$$x - 3 = \pm\sqrt{7}$$

$$x = 3 \pm \sqrt{7}$$

Solve Using the Quadratic Formula:

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

ex. $2x^2 - 6x = -1$

$$\overset{a}{2}x^2 - \overset{b}{6}x + \overset{c}{1} = 0$$

$$\frac{28}{2} \sqrt{\frac{16}{2} - \frac{4}{2}} = \frac{28}{2} \sqrt{4 - 2} = \frac{28}{2} \sqrt{2} = 14\sqrt{2}$$

$$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(2)(1)}}{2(2)}$$

$$x = \frac{6 \pm \sqrt{36 - 8}}{4}$$

$$x = \frac{6 \pm \sqrt{28}}{4}$$

$$x = \frac{6 \pm 4\sqrt{2}}{4}$$

$$x = \frac{3 \pm 2\sqrt{2}}{2}$$

The Discriminant:

$$b^2 - 4ac > 0 \quad 2 \text{ real solutions}$$

$$b^2 - 4ac = 0 \quad 1 \text{ real solution M2}$$

$$b^2 - 4ac < 0 \quad 2 \text{ complex solutions}$$

Tell the type of solutions:

$$4x^2 - 8x + 1 = 0$$

$$b^2 - 4ac$$

$$(-8)^2 - 4(4)(1)$$

$$64 - 16$$

2 real

~~4x~~

$$5x^2 - x + 7 = 0$$

$$(-1)^2 - 4(5)(7)$$

$$1 - 20(7)$$

$$1 - 140 = -139$$

2 complex

Use the formula $N = 23.4x^2 - 259.1x + 815.8$ to answer this question: In which year will 1000 police officers be convicted of a felonies?

In a 25in TV, the length of the screen's diagonals is 25in. If the screen's height is 15in, what is its width?

Suggested Homework:
Chapter P.8 pg.97 #'s
5,17,35,49,61,67,73,75,83,91