

ACCUPLACER PREP

Elementary Algebra

SECTION 4

- Solving Quadratic Equations

General Information

- About 12 questions
- Calculator for some problems
 - will pop up on screen when allowed
- Untimed

Solving Quadratic Equations

Quadratic Equation

an equation that can be written in the form $ax^2 + bx + c = 0$, where a , b and c are real numbers and $a \neq 0$

Zero-Factor Property

If a and b are real numbers and if $ab = 0$, then $a = 0$ or $b = 0$

Solve the equation.

$$(x + 8)(2x - 3) = 0$$

Begin by setting each factor equal to 0

$$(x + 8) = 0 \quad (2x - 3) = 0$$

Solve each equation

$$\begin{array}{r} x + 8 = 0 \\ -8 \quad -8 \\ \hline x = -8 \end{array} \quad \begin{array}{r} 2x - 3 = 0 \\ +3 \quad +3 \\ \hline \frac{2x}{2} = \frac{3}{2} \end{array}$$

Therefore, $x = -8$ or $x = \frac{3}{2}$

Solve the equation.

$$y(2y + 4) = 0$$

Begin by setting each factor equal to 0

$$y = 0 \quad (2y + 4) = 0$$

Solve each equation

$$\begin{array}{r} 2y + 4 = 0 \\ -4 \quad -4 \\ \hline \frac{2y}{2} = \frac{-4}{2} \\ y = -2 \end{array}$$

Therefore, $y = 0$ or $y = -2$

Solve the equation.

$$x^2 - 4x - 5 = 0$$

$$(x+1)(x-5) = 0$$

$$(x+1) = 0 \quad (x-5) = 0$$

$$\begin{array}{r} x+1=0 \\ -1 \quad -1 \\ \hline x=-1 \end{array} \quad \begin{array}{r} x-5=0 \\ +5 \quad +5 \\ \hline x=5 \end{array}$$

Therefore, $x = -1$ or $x = 5$

FACTOR first

Set each factor equal to 0

Solve each equation

Solve the equation.

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

$$\frac{-8 \quad -8}{-8 \quad -8}$$

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

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

$$(x-2) = 0 \quad (x+4) = 0$$

$$\begin{array}{r} x-2=0 \\ +2 \quad +2 \\ \hline x=2 \end{array} \quad \begin{array}{r} x+4=0 \\ -4 \quad -4 \\ \hline x=-4 \end{array}$$

Therefore, $x = 2$ or $x = -4$ 

What's different about this one?

Begin by re-arranging the equation so that it is equal to 0. Be sure to keep the squared term positive.

FACTOR

Set each factor equal to 0 and solve

QUADRATIC FORMULA

The solutions to a quadratic equation in the form $ax^2 + bx + c = 0$, where $a \neq 0$ can be found by using the following formula:

a concise way to write...

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

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

Solve using the Quadratic Formula. Round to the nearest hundredth, if necessary.

$$3k^2 + 4k - 13 = 0$$

$$a = 3$$

$$b = 4$$

$$c = -13$$

Determine values of a, b, & c

Write the formula

Plug in the values

Simplify

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

$$x = \frac{-4 \pm \sqrt{4^2 - 4 \cdot 3 \cdot -13}}{2 \cdot 3}$$

$$x = \frac{-4 \pm \sqrt{16 + 156}}{6}$$

$$x = \frac{-4 \pm \sqrt{172}}{6}$$

$$x = \frac{-4 \pm 13.11}{6}$$

$$x = \frac{-4 + 13.11}{6}$$

$$x = \frac{9.11}{6}$$

$$x = 1.52$$

$$x = \frac{-4 - 13.11}{6}$$

$$x = \frac{-17.11}{6}$$

$$x = -2.85$$

The solutions are: 1.52 or -2.85

Solve using the Quadratic Formula. Leave answers in exact form (Radical Form)

$$b^2 - 10b + 17 = 0$$

$$a = 1$$

$$b = -10$$

$$c = 17$$

Determine values of a, b, & c

Write the formula

Plug in the values

Simplify

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

$$x = \frac{-(-10) \pm \sqrt{(-10)^2 - 4 \cdot 1 \cdot 17}}{2 \cdot 1}$$

$$x = \frac{10 \pm \sqrt{100 - 68}}{2}$$

$$x = \frac{10 \pm \sqrt{32}}{2}$$

$$x = \frac{10 \pm \sqrt{16}\sqrt{2}}{2}$$

$$x = \frac{10 \pm 4\sqrt{2}}{2}$$

$$x = \frac{2(5 \pm 2\sqrt{2})}{2}$$

$$x = 5 + 2\sqrt{2} \quad \text{or} \quad 5 - 2\sqrt{2}$$

Solve using the Quadratic Formula. Round to the nearest hundredth, if necessary.

$$-4b^2 + 2b - 9 = 0$$

$$a = -4$$

$$b = 2$$

$$c = -9$$

Determine values of a, b, & c

Write the formula

Plug in the values

Simplify

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

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

$$x = \frac{-2 \pm \sqrt{4 - 144}}{-8}$$

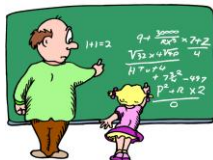
$$x = \frac{-2 \pm \sqrt{-140}}{-8}$$



Since you can't take the square root of a negative number, there is **no real solution** to this equation.

RESOURCES:

Go to your nearest Academic Services Lab and you can get a packet of practice problems. You can also work with an instructor!



ONLINE RESOURCES:

<http://www.purplemath.com/>

"Accuplacer Math" can be found on the right side of the screen

<http://accuplacerpractice.collegeboard.org/>

need to create an account but appears to be free