Inspiring Greatness

ISD

INDEPENDENCE SCHOOL DISTRICT

Math Virtual Learning

Algebra 1 - Semester 2

April 22, 2020

Algebra 1 - Semester 2
Lesson: April 22, 2020

Objective/Learning Target:

Students will be able to use solve a quadratic function using the Quadratic Formula.

Let's Get Started!

Simplify each radical expression

$\sqrt{12}$

$\sqrt{11}$

$\sqrt{144}$

$\sqrt{20}$

$\sqrt{48}$

Let's Get Started! ANSWER

$\sqrt{12} = \sqrt{4} * \sqrt{3} = 2\sqrt{3}$

$\sqrt{11} = CANNOT\ BE\ SIMPLIFIED$

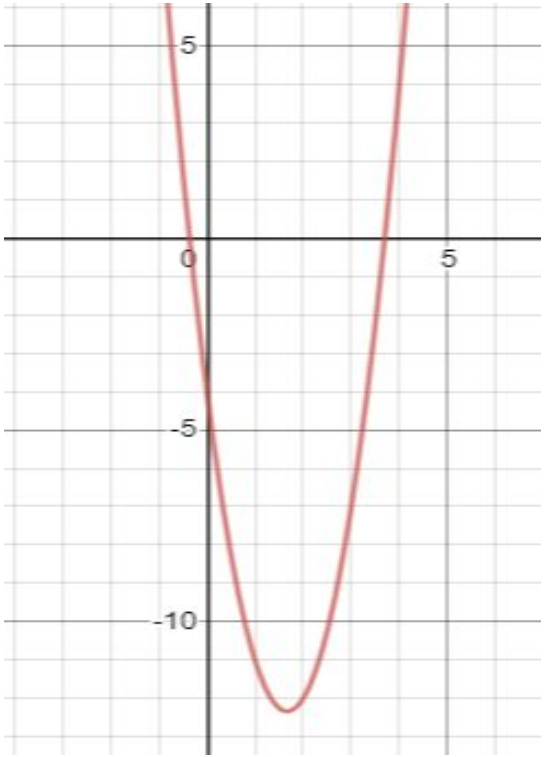
$\sqrt{144} = 12$

$\sqrt{20} = \sqrt{4} * \sqrt{5} = 2\sqrt{5}$

$\sqrt{48} = \sqrt{16} * \sqrt{3} = 4\sqrt{3}$

Let's Get Started!

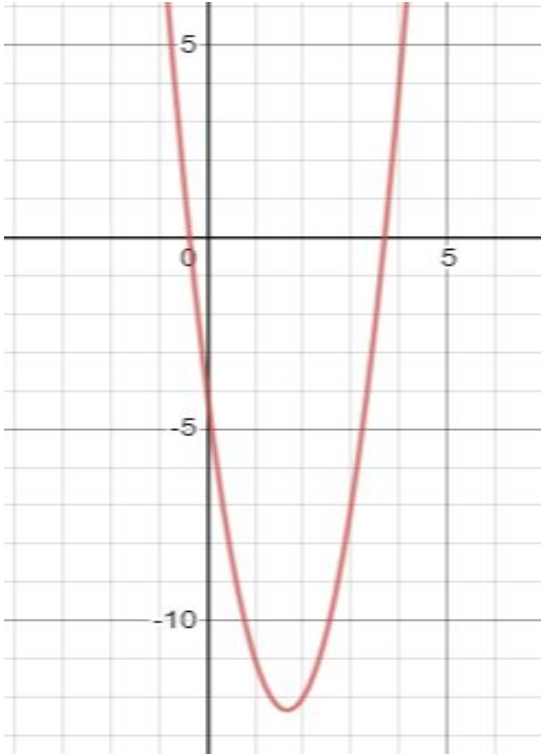
Try to solve the function $3x^2 - 10x - 4$ using factoring or the graph at the right.



Let's Get Started!

What problems did you run into when factoring?

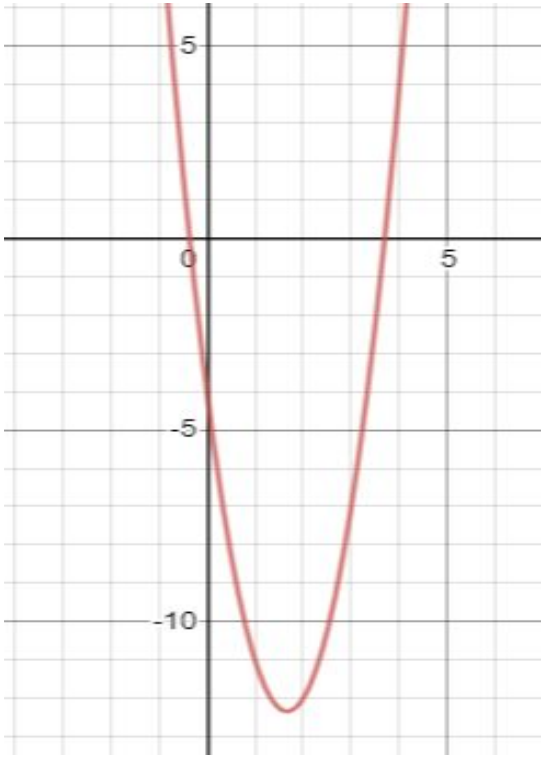
Why was the graph that was provided not very helpful?



Let's Get Started ANSWER

What problems did you run into when factoring?

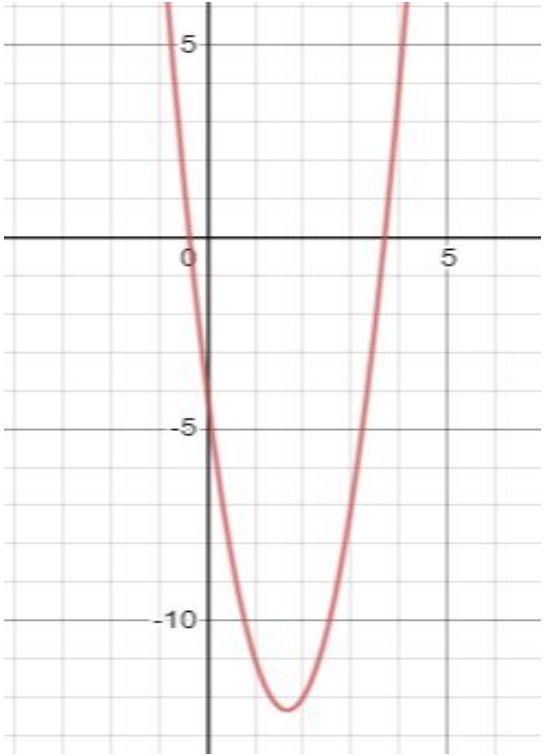
The function provided does not factor. So it was impossible to solve by factoring.



Let's Get Started ANSWER

Why was the graph that was provided not very helpful?

It was difficult to use the graph because the x-intercepts are not integers. Estimating the decimals in nearly impossible...even if you use technology, you are still only **ESTIMATING** the answers to a rounded decimal.



Today we are going to explore how to solve a quadratic equation using an Algebra formula called the QUADRATIC FORMULA.
Click to watch the video.

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

Mathmeeting.com

Pros and Cons of the Quadratic Formula

PROS of the Quadratic Formula	CONS of the Quadratic Formula
★ Works for ANY quadratic function - so it can be used in any situation ★ Is a consistent formula - the structure of the formula never changes ★ Makes it easy to see if there is one, two or no solutions	★ Longer method than most - so it takes longer for each problem ★ The formula has a lot of details - so you must pay closer attention to each step to watch for mistakes

Quadratic Formula

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

for solving ... $ax^2 + bx + c = 0$

Lesson Activity

Identify which person set up their Quadratic Formula correctly for the function $3x^2 - 10x - 4$.

Mary

$$x = \frac{-10 \pm \sqrt{(-10)^2 - 4(3)(-4)}}{2(3)}$$

Diego

$$x = \frac{10 \pm \sqrt{(-10)^2 - 4(3)(-4)}}{2(3)}$$

Lesson Activity

Quadratic Formula

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

for solving ... $ax^2 + bx + c = 0$

Identify which person set up their Quadratic Formula correctly for the function $3x^2 - 10x - 4$.

Mary

$$x = \frac{-10 \pm \sqrt{(-10)^2 - 4(3)(-4)}}{2(3)}$$

Diego

$$x = \frac{10 \pm \sqrt{(-10)^2 - 4(3)(-4)}}{2(3)}$$

Diego is correct. At the start of the formula, it states x = **-b** .
In this problem b = -10, so -(-10) is a positive 10. Therefore, Diego's positive 10 is correct. Mary used a -10

Lesson Practice #1

Use the quadratic formula to solve each quadratic equation

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

Quadratic Formula

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

for solving ... $ax^2 + bx + c = 0$

Lesson Practice #1 ANSWER

Use Desmos.com to solve each quadratic equation

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

✓ It is equal to 0

Quadratic Formula

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

for solving ... $ax^2 + bx + c = 0$

$$x = \frac{-7 \pm \sqrt{(7)^2 - 4(4)(-2)}}{2(4)}$$

x = 0.25 (¼) and -2

Lesson Practice #2

Use the Quadratic Formula to solve each quadratic equation

$$5x^2 - 12x = -7$$

Quadratic Formula

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

for solving ... $ax^2 + bx + c = 0$

Lesson Practice #2 ANSWER

Use Desmos.com to solve each quadratic equation

$5x^2 - 12x = -7$

✓ It is NOT equal to 0 → $5x^2 - 12x + 7 = 0$

Quadratic Formula

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

for solving ... $ax^2 + bx + c = 0$

$5x^2 - 12x + 7 = 0$

$$x = \frac{12 \pm \sqrt{(-12)^2 - 4(5)(7)}}{2(5)}$$

x = 1 and 1.4 (7/5)

Lesson Practice #3

Use the Quadratic Formula to solve each quadratic equation

$$3x^2 + 7x - 3 = 0$$

Quadratic Formula

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

for solving ... $ax^2 + bx + c = 0$

Lesson Practice #3 ANSWER

Use Desmos.com to solve each quadratic equation

$3x^2 + 7x - 3 = 0$

✓ It is equal to 0

$$x = \frac{-7 \pm \sqrt{(7)^2 - 4(3)(3)}}{2(3)}$$

$$x = \frac{-7 \pm \sqrt{13}}{6}$$

Quadratic Formula

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

for solving ... $ax^2 + bx + c = 0$

Lesson Practice #4

Use the Quadratic Formula to solve each quadratic equation

$$x^2 + 8x + 13 = 0$$

Quadratic Formula

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

for solving ... $ax^2 + bx + c = 0$

Lesson Practice #3 ANSWER

Use Desmos.com to solve each quadratic equation

$1x^2 + 8x + 13 = 0$

✓ It is equal to 0

Quadratic Formula

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

for solving ... $ax^2 + bx + c = 0$

$$x = \frac{-8 \pm \sqrt{(8)^2 - 4(1)(13)}}{2(1)} = x = \frac{-8 \pm \sqrt{12}}{2}$$

$$= x = \frac{-8 \pm 2\sqrt{3}}{2}$$

$$= x = -4 \pm \sqrt{3}$$

Additional Resources

Here is an extra video and practice site on the Quadratic formula.

Video

Practice