

Bell Work

For #1 and #2 use $f(x) = x^2 + 8x - 48$.

1. What are the roots for the quadratic function?
2. What is the vertex of the quadratic function?
3. What is a point of the line with an equation of $3x - 4y = -20$?
4. What is the equation for the absolute value parent function?

Find the roots of the quadratic function by completing the square.

$$f(x) = x^2 - 6x - 8$$

$$x^2 - 6x - 8 = 0$$

$$x^2 - 6x = 8$$

$$x^2 - 6x + 9 = 8 + 9$$

$$\sqrt{(x-3)^2} = \sqrt{17}$$

$$x - 3 = \pm\sqrt{17}$$

$$x = 3 \pm \sqrt{17}$$

1. *Set the function equal to 0.*
2. *Move the c to the other side.*
3. *Add the new c to both sides.*

$$c = \left(\frac{b}{2}\right)^2 = \left(\frac{-6}{2}\right)^2 = (-3)^2 = 9$$

4. *Factor the left side.*
5. *Square root both sides.*
6. *Solve for x.*
7. *2 Answers*

Find the roots of the quadratic function by completing the square.

$$f(x) = x^2 + 4x - 1$$

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

$$x^2 + 4x = 1$$

$$x^2 + 4x + 4 = 1 + 4$$

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

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

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

1. *Set the function equal to 0.*
2. *Move the c to the other side.*
3. *Add the new c to both sides.*

$$c = \left(\frac{b}{2}\right)^2 = \left(\frac{4}{2}\right)^2 = (2)^2 = 4$$

4. *Factor the left side.*
5. *Square root both sides.*
6. *Solve for x.*
7. *2 Answers*

Find the roots of the quadratic function by completing the square.

$$f(x) = x^2 - 7x + 3$$

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

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

$$x^2 - 7x + 12.25 = -3 + 12.25$$

$$\sqrt{(x - 3.5)^2} = \sqrt{9.25}$$

$$x - 3.5 = \pm \sqrt{9.25}$$

$$x = 3.5 \pm \sqrt{9.25}$$

1. *Set the function equal to 0.*
2. *Move the c to the other side.*
3. *Add the new c to both sides.*

$$c = \left(\frac{b}{2}\right)^2 = \left(\frac{-7}{2}\right)^2 = (-3.5)^2 = 12.25$$

4. *Factor the left side.*
5. *Square root both sides.*
6. *Solve for x.*
7. *2 Answers*

Find the roots of the quadratic function by completing the square.

$$f(x) = x^2 + 11x + 10$$

$$x^2 + 11x + 10 = 0$$

$$x^2 + 11x = -10$$

$$x^2 + 11x + 30.25 = -10 + 30.25$$

$$\sqrt{(x + 5.5)^2} = \sqrt{20.25}$$

$$x + 5.5 = \pm 4.5$$

$$x = 5.5 \pm 4.5$$

$$x = -5.5 - 4.5 = -10$$

$$x = -5.5 + 4.5 = -1$$

1. *Set the function equal to 0.*
2. *Move the c to the other side.*
3. *Add the new c to both sides.*

$$c = \left(\frac{b}{2}\right)^2 = \left(\frac{11}{2}\right)^2 = (5.5)^2 = 30.25$$

4. *Factor the left side.*
5. *Square root both sides.*
6. *Solve for x.*
7. *2 Answers*

Find the roots of the quadratic function by completing the square.

$$f(x) = x^2 - 12x + 36$$

$$x^2 - 12x + 36 = 0$$

$$x^2 - 12x = -36$$

$$x^2 - 12x + 36 = -36 + 36$$

$$\sqrt{(x-6)^2} = \sqrt{0}$$

$$x - 6 = 0$$

$$x = 6$$

1. *Set the function equal to 0.*
2. *Move the c to the other side.*
3. *Add the new c to both sides.*

$$c = \left(\frac{b}{2}\right)^2 = \left(\frac{-12}{2}\right)^2 = (-6)^2 = 36$$

4. *Factor the left side.*
5. *Square root both sides.*
6. *Solve for x.*
7. *2 Answers*

Find the roots of the quadratic function by completing the square.

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

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

$$x^2 + 2x = 6$$

$$x^2 + 2x + 1 = 6 + 1$$

$$\sqrt{(x + 1)^2} = \sqrt{7}$$

$$x + 1 = \pm\sqrt{7}$$

$$x = -1 \pm \sqrt{7}$$

1. *Set the function equal to 0.*
2. *Move the c to the other side.*
3. *Add the new c to both sides.*

$$c = \left(\frac{b}{2}\right)^2 = \left(\frac{2}{2}\right)^2 = (1)^2 = 1$$

4. *Factor the left side.*
5. *Square root both sides.*
6. *Solve for x.*
7. *2 Answers*

Assignment:

Finding the Roots by Completing the Square A Worksheet