

Bell Work

For #1 and #2 use $f(x) = x^2 - 6x - 4$.

1. What are the roots for the quadratic function?
2. What is the vertex of the quadratic function?
3. What is the slope of the line with an equation of $3x + 4y = -20$?
4. What is the equation for the constant parent function?

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

$$f(x) = 2x^2 - 8x + 3$$

$$2x^2 - 8x + 3 = 0$$

$$2x^2 - 8x = -3$$

$$x^2 - 4x = -1.5$$

$$x^2 - 4x + 4 = -1.5 + 4$$

$$\sqrt{(x-2)^2} = \sqrt{2.5}$$

$$x - 2 = \pm\sqrt{2.5}$$

$$x = 2 \pm \sqrt{2.5}$$

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

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

5. *Factor the left side.*
6. *Square root both sides.*
7. *Solve for x.*
8. *2 Answers*

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

$$f(x) = 5x^2 - 45x + 12$$

$$5x^2 + 45x + 12 = 0$$

$$5x^2 + 45x = -12$$

$$x^2 + 9x = -12$$

$$x^2 + 9x + 20.25 = -12 + 20.25$$

$$\sqrt{(x + 4.5)^2} = \sqrt{8.25}$$

$$x + 4.5 = \pm\sqrt{8.25}$$

$$x = 4.5 \pm \sqrt{8.25}$$

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

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

5. *Factor the left side.*
6. *Square root both sides.*
7. *Solve for x.*
8. *2 Answers*

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

$$f(x) = 4x^2 + 28x - 9$$

$$4x^2 + 28x - 9 = 0$$

$$4x^2 + 28x = 9$$

$$x^2 + 7x = 2.25$$

$$x^2 + 7x + 12.25 = 2.25 + 12.25$$

$$\sqrt{(x + 3.5)^2} = \sqrt{14.5}$$

$$x + 3.5 = \pm\sqrt{14.5}$$

$$x = -3.5 \pm \sqrt{14.5}$$

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

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

5. *Factor the left side.*
6. *Square root both sides.*
7. *Solve for x.*
8. *2 Answers*

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

$$f(x) = 4x^2 - 24x + 35$$

$$4x^2 - 24x + 35 = 0$$

$$4x^2 - 24x = -35$$

$$x^2 - 6x = -8.75$$

$$x^2 - 6x + 9 = -8.75 + 9$$

$$\sqrt{(x-3)^2} = \sqrt{0.25}$$

$$x - 3 = \pm 0.5$$

$$x = 3 + 0.5 = 3.5$$

$$x = 3 - 0.5 = 2.5$$

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

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

5. *Factor the left side.*
6. *Square root both sides.*
7. *Solve for x.*
8. *2 Answers*

$$f(x) = 2x^2 - 8x + 3$$

$$f(x) = 5x^2 - 45x + 12$$

$$f(x) = 4x^2 + 28x - 9$$

$$f(x) = 4x^2 - 24x + 35$$

Use completing the square when a is a factor of b .

$$f(x) = 4x^2 + 15x - 3$$

Don't use completing the square when a is NOT a factor of b .

$$f(x) = 3x^2 + 12x - 4$$

Don't use completing the square when $1/a$ is a repeating decimal.

Assignment:

**Finding the Roots by Completing the
Square B Worksheet**