Square Roots and Quadratic Functions

Interactive Math Notebook Activities and Scaffolded Notes

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- Square and Square Root Review with Rational Numbers
- What is an irrational number?
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- What does it mean to complete the square?
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- Solving a Quadratic Equation by Completing the Square
- Solving a Quadratic Equation using the Quadratic Formula
- Finding the Coordinates for the Graph of a Quadratic Function
- Graphing a Quadratic Function

Scaffolded Notes

What is a square number?	What is a square root?
Show it on a square with numbers.	Show it on a square with numbers.
Show it on a square with variables.	Show it on a square with variables.
Show it on a square with a binomial.	Show it on a square with a binomial.

Square and Square Root Review With Whole Numbers

$1^2 = 1$	$\sqrt{1} = 1$
$2^2 = 4$	$\sqrt{4} = 2$
$3^2 =$ ___	$\sqrt{} =$ ___
$4^2 =$ ___	$\sqrt{} =$ ___
$5^2 =$ ___	$\sqrt{} =$ ___
$6^2 =$ ___	$\sqrt{} =$ ___
$7^2 =$ ___	$\sqrt{} =$ ___
$8^2 =$ ___	$\sqrt{} =$ ___
$9^2 =$ ___	$\sqrt{} =$ ___
$10^2 =$ ___	$\sqrt{} =$ ___

Square and Square Root Review With Rational Numbers

$(\frac{1}{2})^2 = \frac{1}{4}$	$\sqrt{\frac{1}{4}} = \frac{1}{2}$
$(\frac{2}{3})^2 = \frac{4}{9}$	$\sqrt{\frac{4}{9}} =$ ___
$(\frac{3}{4})^2 = \frac{}{}$	$\sqrt{\frac{}{}} =$ ___
$(\frac{4}{5})^2 = \frac{}{}$	$\sqrt{\frac{}{}} =$ ___

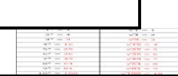
What is a square number? A number that can be expressed as the square of a factor.	What is a square root? One of the two equal factors of a number.
Show it on a square with numbers. 5 5 $\boxed{25}$ Square Number = 25	Show it on a square with numbers. 5 5 $\boxed{25}$ The square root of 25 is 5.
Show it on a square with variables. x x $\boxed{x^2}$ Square Number = x^2	Show it on a square with variables. x x $\boxed{x^2}$ The square root of x^2 is x.
Show it on a square with a binomial. X+3 X+3 $\boxed{(x+3)^2}$ Square Number = $(x+3)^2$	Show it on a square with a binomial. X+3 X+3 $\boxed{(x+3)^2}$ The square root of $(x+3)^2$ is (x+3).

Square and Square Root Review With Whole Numbers

$1^2 = 1$	$\sqrt{1} = 1$
$2^2 = 4$	$\sqrt{4} = 2$
$3^2 = 9$	$\sqrt{9} = 3$
$4^2 = 16$	$\sqrt{16} = 4$
$5^2 = 25$	$\sqrt{25} = 5$
$6^2 = 36$	$\sqrt{36} = 6$
$7^2 = 49$	$\sqrt{49} = 7$
$8^2 = 64$	$\sqrt{64} = 8$
$9^2 = 81$	$\sqrt{81} = 9$
$10^2 = 100$	$\sqrt{100} = 10$

Square and Square Root Review With Rational Numbers

$(\frac{1}{2})^2 = \frac{1}{4}$	$\sqrt{\frac{1}{4}} = \frac{1}{2}$
$(\frac{2}{3})^2 = \frac{4}{9}$	$\sqrt{\frac{4}{9}} = \frac{2}{3}$
$(\frac{3}{4})^2 = \frac{9}{16}$	$\sqrt{\frac{9}{16}} = \frac{3}{4}$
$(\frac{4}{5})^2 = \frac{16}{25}$	$\sqrt{\frac{16}{25}} = \frac{4}{5}$



What is an irrational number?	Give some examples of irrational numbers?
	Give some examples of whole number square roots that simplify to irrational numbers?
	Give some examples of rational number square roots that simplify to irrational numbers?

Solving Quadratic Equations without Factoring

You can use this method when you have a second degree term (i.e. $4x^2$) and a zero degree term (i.e. 28).

Step 1: Get your zero degree term on one side of the equation, and your second degree term on the other.		
Step 2: If your second degree term has a coefficient, get rid of it using the multiplication or division principle.		
Step 3: Take the square root of both sides in order to cancel out the square term. (This breaks the equation into two separate parts.)		
Step 4: Solve for the variable.		

Solving Quadratic Equations without Factoring

You can use this method when you have a squared binomial (i.e. $(x + 3)^2$) and a zero degree term (i.e. 50).

Step 1: Get your zero degree term on one side of the equation, and your squared binomial term on the other.		
Step 2: Take the square root of both sides in order to cancel out the square term. (This breaks the equation into two separate parts.)		
Step 3: Solve for the variable.		

What is an irrational number?	
Any number that can be written as a non-repeating, non-terminating decimal.	Give some examples of irrational numbers? $\pi, \sqrt{2}, \sqrt{3}$
	Give some examples of whole number square roots that simplify to irrational numbers? $\sqrt{2}, \sqrt{3}$
	Give some examples of rational number square roots that simplify to irrational numbers? $\sqrt{\frac{2}{5}}, \sqrt{\frac{1}{2}}$

Solving Quadratic Equations without Factoring

You can use this method when you have a second degree term (i.e. $4x^2$) and a zero degree term (i.e. 28).

Step 1: Get your zero degree term on one side of the equation, and your second degree term on the other.	$2x^2 - 14 = 0$ $2x^2 = 14$	
Step 2: If your second degree term has a coefficient, get rid of it using the multiplication or division principle.	$\frac{2x^2}{2} = \frac{14}{2}$ $x^2 = 7$	
Step 3: Take the square root of both sides in order to cancel out the square term. (This breaks the equation into two separate parts.)	$x = \sqrt{7}$	$x = -\sqrt{7}$
Step 4: Solve for the variable.	$x \approx 2.646$	$x \approx -2.646$

Solving Quadratic Equations without Factoring

You can use this method when you have a squared binomial (i.e. $(x+3)^2$) and a zero degree term (i.e. 50).

Step 1: Get your zero degree term on one side of the equation, and your squared binomial term on the other.	$(x-5)^2 = 10$	
Step 2: Take the square root of both sides in order to cancel out the square term. (This breaks the equation into two separate parts.)	$x - 5 = \sqrt{10}$ $x = 5 + \sqrt{10}$	$x - 5 = -\sqrt{10}$ $x = 5 - \sqrt{10}$
Step 3: Solve for the variable.	$x \approx 8.162$	$x \approx 1.838$

Finding the Square Roots of Monomials	
	$\sqrt{x^{10}}$
	$\sqrt{121x^2}$
	$\sqrt{49x^6y^4}$

Rules for Simplifying Square Roots

Product Rule How does the product rule help us when simplifying square roots?	Give an example with variables.	Give an example with numbers.
Quotient Rule How does the product rule help us when simplifying square roots?	Give an example with variables.	Give an example with numbers.
Addition Rule How does the addition rule help us when simplifying square roots?	Give an example with variables.	Give an example with numbers.
Subtraction Rule How does the subtraction rule help us when simplifying square roots?	Give an example with variables.	Give an example with numbers.

Finding the Square Roots of Monomials

$$\sqrt{x^{10}}$$
$$\sqrt{xxxxxxxxxx}$$
$$\sqrt{x^2}\sqrt{x^2}\sqrt{x^2}\sqrt{x^2}\sqrt{x^2}$$
$$xxxxx$$
$$x^5$$

$$\sqrt{121x^2}$$
$$\sqrt{11 \cdot 11xx}$$
$$\sqrt{11^2}\sqrt{x^2}$$
$$11x$$

$$\sqrt{49x^6y^4}$$
$$\sqrt{7 \cdot 7xxxxxxyyyy}$$
$$\sqrt{7^2}\sqrt{x^2}\sqrt{x^2}\sqrt{x^2}\sqrt{y^2}\sqrt{y^2}$$
$$7xxxyy$$
$$7x^3y^2$$

Rules for Simplifying Square Roots

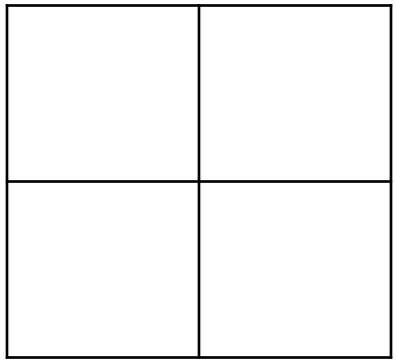
Product Rule How does the product rule help us when simplifying square roots? It allows you to split terms into their factors so that you can pull factor pairs out of the radical.	Give an example with variables. $\sqrt{x^{10}y^4}$ $\sqrt{xxxxxxxxxxyyyy}$ $\sqrt{x^2}\sqrt{x^2}\sqrt{x^2}\sqrt{x^2}\sqrt{x^2}\sqrt{y^2}\sqrt{y^2}$ $xxxxxyy$ x^5y^2	Give an example with numbers. $\sqrt{108}$ $\sqrt{2 \cdot 2 \cdot 3 \cdot 3 \cdot 3}$ $\sqrt{2^2}\sqrt{3^2}\sqrt{3}$ $2 \cdot 3\sqrt{3}$ $6\sqrt{3}$
Quotient Rule How does the product rule help us when simplifying square roots? It allows you to factor the terms in your numerator and denominator separately so that you can pull factor pairs out of the two parts separately.	Give an example with variables. $\sqrt{\frac{x^2y^6}{z^{10}}}$ $\sqrt{\frac{xxyyyyyy}{zzzzzzzzzz}}$ $\frac{\sqrt{x^2}\sqrt{y^2}\sqrt{y^2}\sqrt{y^2}}{\sqrt{z^2}\sqrt{z^2}\sqrt{z^2}\sqrt{z^2}\sqrt{z^2}}$ $\frac{xyyy}{zzzzz}$ $\frac{xy^3}{z^5}$	Give an example with numbers. $\sqrt{\frac{625}{36}}$ $\sqrt{\frac{5 \cdot 5 \cdot 5 \cdot 5}{2 \cdot 2 \cdot 3 \cdot 3}}$ $\frac{\sqrt{5^2}\sqrt{5^2}}{\sqrt{2^2}\sqrt{3^2}}$ $\frac{5 \cdot 5}{2 \cdot 3}$ $\frac{25}{6}$
Addition Rule How does the addition rule help us when simplifying square roots? It allows you to add the coefficients of radicals if they are like radical terms.	Give an example with variables. $a\sqrt{x} + b\sqrt{x}$ $(a + b)\sqrt{x}$	Give an example with numbers. $2\sqrt{3} + 7\sqrt{3}$ $(2 + 7)\sqrt{3}$ $9\sqrt{3}$
Subtraction Rule How does the subtraction rule help us when simplifying square roots? It allows you to subtract the coefficients of radicals if they are like radical terms.	Give an example with variables. $a\sqrt{x} - b\sqrt{x}$ $(a - b)\sqrt{x}$	Give an example with numbers. $9\sqrt{2} - 6\sqrt{2}$ $(9 - 6)\sqrt{2}$ $3\sqrt{2}$

Square Roots in Simplest Radical Form	Number	Variable	Term with Numbers and Variables
Step 1: Factor the term that is inside of your radical.			
Step 2: Rewrite as many of the factors as you can as square terms.			
Step 3: Let the square root cancel the square terms and keep the rest of the factors inside of the radicals.			
Step 4: Simplify.			

Square Roots in Simplest Radical Form With Fractions	Number	Variable	Term with Numbers and Variables
Step 1: Factor the term in your numerator and factor the term in your denominator.			
Step 2: Rewrite as many of the factors as you can as square terms.			
Step 3: Let the square root cancel the square terms and keep the rest of the factors inside of the radicals.			
Step 4: If you still have a square root in your denominator you will need to rationalize the denominator.			
Step 5: Simplify.			

Square Roots in Simplest Radical Form	Number	Variable	Term with Numbers and Variables
Step 1: Factor the term that is inside of your radical.	$\sqrt{500}$ $\sqrt{2\cdot 2\cdot 5\cdot 5\cdot 5}$	$\sqrt{xy^4z^5}$ $\sqrt{xyyyyzzzzz}$	$\sqrt{300xy^4z^6}$ $\sqrt{2\cdot 2\cdot 3\cdot 5\cdot 5\, xyyyyzzzzzz}$
Step 2: Rewrite as many of the factors as you can as square terms.	$\sqrt{2^2\cdot 5^2\cdot 5}$	$\sqrt{xy^2y^2z^2z^2z}$	$\sqrt{2^2\cdot 3\cdot 5^2xy^2y^2z^2z^2z^2}$
Step 3: Let the square root cancel the square terms and keep the rest of the factors inside of the radicals.	$\sqrt{2^2}\sqrt{5^2}\sqrt{5}$ $2\cdot 5\sqrt{5}$	$\sqrt{y^2}\sqrt{y^2}\sqrt{z^2}\sqrt{z^2}\sqrt{xz}$ $yyzz\sqrt{xz}$	$\sqrt{2^2}\sqrt{5^2}\sqrt{y^2}\sqrt{y^2}\sqrt{z^2}\sqrt{z^2}\sqrt{z^2}\sqrt{3x}$ $2\cdot 5yyzz\sqrt{3x}$
Step 4: Simplify.	$10\sqrt{5}$	$y^2z^2\sqrt{xz}$	$10y^2z^2\sqrt{3x}$

Square Roots in Simplest Radical Form With Fractions	Number	Variable	Term with Numbers and Variables
Step 1: Factor the term in your numerator and factor the term in your denominator.	$\sqrt{\frac{125}{48}}$ $\frac{\sqrt{5\cdot 5\cdot 5}}{\sqrt{2\cdot 2\cdot 2\cdot 2\cdot 3}}$	$\sqrt{\frac{x^3y^8}{z^3}}$ $\sqrt{\frac{xxxyy}{zzz}}$	$\sqrt{\frac{225x^2}{yz^2}}$ $\sqrt{\frac{3\cdot 3\cdot 5\cdot 5xx}{yzz}}$
Step 2: Rewrite as many of the factors as you can as square terms.	$\frac{\sqrt{5^2}\sqrt{5}}{\sqrt{2^2}\sqrt{2^2}\sqrt{3}}$	$\frac{\sqrt{x^2}\sqrt{x}\sqrt{y^2}}{\sqrt{z^2}\sqrt{z}}$	$\frac{\sqrt{3^2}\sqrt{5^2}\sqrt{x^2}}{\sqrt{y}\sqrt{z^2}}$
Step 3: Let the square root cancel the square terms and keep the rest of the factors inside of the radicals.	$\frac{5\sqrt{5}}{2\cdot 2\sqrt{3}}$ $\frac{5\sqrt{5}}{4\sqrt{3}}$	$\frac{xy\sqrt{x}}{z\sqrt{z}}$	$\frac{3\cdot 5x}{z\sqrt{y}}$ $\frac{15x}{z\sqrt{y}}$
Step 4: If you still have a square root in your denominator you will need to rationalize the denominator.	$\frac{5\sqrt{5}}{4\sqrt{3}}\cdot\frac{\sqrt{3}}{\sqrt{3}}$ $\frac{5\sqrt{15}}{4\cdot 3}$	$\frac{xy\sqrt{x}}{z\sqrt{z}}\cdot\frac{\sqrt{z}}{\sqrt{z}}$ $\frac{xy\sqrt{xz}}{zz}$	$\frac{15x}{z\sqrt{y}}\cdot\frac{\sqrt{y}}{\sqrt{y}}$ $\frac{15x\sqrt{y}}{zy}$
Step 5: Simplify.	$\frac{5\sqrt{15}}{12}$	$\frac{xy\sqrt{xz}}{z^2}$	$\frac{15x\sqrt{y}}{zy}$

What does it mean to complete the square?	Give an example on a square.	Give an example with an expression.
		

Steps for Completing the Square	Example with a Positive Coefficient on the X-Term	Example with a Negative Coefficient on the X-Term
Step 1: What is the coefficient of your x-term?		
Step 2: Take the number from step 1, divide it by 2 and square the quotient.		
Step 3: Add the number from step 2 to your original expression.		
Step 4: Factor your trinomial.		
Step 5: Simplify.		

What does it mean to complete the square?

You will be adding a number to an expression that will allow you to factor it into the square of a binomial.

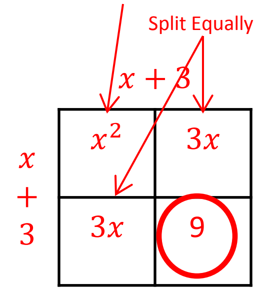
Give an example on a square.

A complete square with binomials has the same binomial on each side.

	x	$+$ 6
x	x^2	$6x$
	$6x$	36

Give an example with an expression.

$x^2 + 6x +$ __9__



You would have to add 9 to the expression in order to have both sides equation the same binomial.

Steps for Completing the Square	Example with a Positive Coefficient on the X-Term $x^2 + 30x$	Example with a Negative Coefficient on the X-Term $x^2 - 6x$
Step 1: What is the coefficient of your x-term?	$x^2 + 30x$ The coefficient of my x-term is 30.	$x^2 - 6x$ The coefficient of my x-term is -6.
Step 2: Take the number from step 1, divide it by 2 and square the quotient.	$(\frac{30}{2})^2$ 15^2 225	$(\frac{-6}{2})^2$ $(-3)^2$ 9
Step 3: Add the number from step 2 to your original expression.	$x^2 + 30x + 225$	$x^2 - 6x + 9$
Step 4: Factor your trinomial.	$(x + 15)(x + 15)$	$(x - 3)(x - 3)$
Step 5: Simplify.	$(x + 15)^2$	$(x - 3)^2$

Solving a Quadratic Equation by Completing the Square	Example with a Positive Coefficient on the X-Term	Example with a Negative Coefficient on the X-Term
Step 1: Move the number term to one side of the equation and keep your x^2 and x terms on the other.		
Step 2: Make sure that the coefficient on your x^2 term is a 1.		
Step 3: Find the number that will complete the square for the x^2 and x terms.		
Step 4: Add the number from step 3 to both sides of the equation.		
Step 4: Factor your trinomial. Simplify.		
Step 5: Take the square root of both sides in order to cancel out the square term. (This breaks the equation into two separate parts.)		
Step 6: Check your solutions.		

Solving a Quadratic Equation by Completing the Square	Example with a Positive Coefficient on the X-Term $x^2 + 2x - 24 = 0$	Example with a Negative Coefficient on the X-Term $2x^2 - 20x - 22 = 0$
Step 1: Move the number term to one side of the equation and keep your x^2 and x terms on the other.	$x^2 + 2x = 24$	$2x^2 - 20x = 22$
Step 2: Make sure that the coefficient on your x^2 term is a 1.	$x^2 + 2x = 24$	$\frac{2x^2}{2} - \frac{20x}{2} = \frac{22}{2}$ $x^2 - 10x = 11$
Step 3: Find the number that will complete the square for the x^2 and x terms.	$(\frac{2}{2})^2 = 1$	$(\frac{-10}{2})^2 = 25$
Step 4: Add the number from step 3 to both sides of the equation.	$x^2 + 2x + 1 = 24 + 1$ $x^2 + 2x + 1 = 25$	$x^2 - 10x + 25 = 11 + 25$ $x^2 - 10x + 25 = 36$
Step 4: Factor your trinomial. Simplify.	$(x + 1)^2 = 25$	$(x - 5)^2 = 36$
Step 5: Take the square root of both sides in order to cancel out the square term. (This breaks the equation into two separate parts.)	$x + 1 = \sqrt{25}$ $x + 1 = 5$ $x = 4$ $x + 1 = -\sqrt{25}$ $x + 1 = -5$ $x = -6$	$x - 5 = \sqrt{36}$ $x - 5 = 6$ $x = 11$ $x - 5 = -\sqrt{36}$ $x - 5 = -6$ $x = -1$
Step 6: Check your solutions.	$(4)^2 + 2(4) - 24 = 0$ $0 = 0$ $(-6)^2 + 2(-6) - 24 = 0$ $0 = 0$	$2(11)^2 - 20(11) - 22 = 0$ $242 - 220 - 22 = 0$ $0 = 0$ $2(-1)^2 - 20(-1) - 22 = 0$ $2 + 20 - 22 = 0$ $0 = 0$

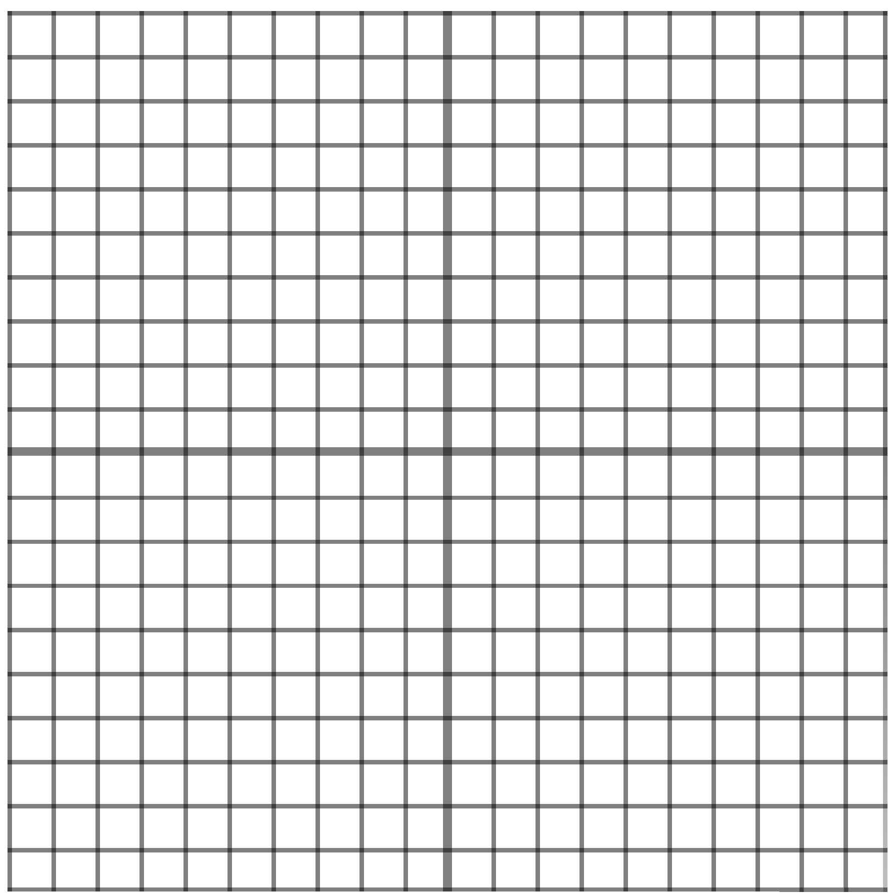
Solving a Quadratic Equation using the Quadratic Formula	Example 1		Example 2	
Step 1: Rewrite your equation in standard form. $ax^2 + bx + c = 0$				
Step 2: Locate your a, b, and c values.	$a =$ ___ $b =$ ___ $c =$ ___		$a =$ ___ $b =$ ___ $c =$ ___	
Step 3: Substitute your a, b, and c values in the Quadratic Formula. $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$				
Step 4: Simplify the numerator. Simplify the denominator.				
Step 5: Split your equation in two. Solve both.				
Step 6: Check your solutions.				

Solving a Quadratic Equation using the Quadratic Formula	Example 1	Example 2
	$x^2 - 3x + 2 = 0$	$3x^2 + 10x + 5 = 0$
Step 1: Rewrite your equation in standard form. $ax^2 + bx + c = 0$	$x^2 - 3x + 2 = 0$	$3x^2 + 10x + 5 = 0$
Step 2: Locate your a, b, and c values.	$a = 1$ $b = -3$ $c = 2$	$a = 3$ $b = 10$ $c = 5$
Step 3: Substitute your a, b, and c values in the Quadratic Formula. $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$	$x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(1)(2)}}{2(1)}$	$x = \frac{-(10) \pm \sqrt{(10)^2 - 4(3)(5)}}{2(3)}$
Step 4: Simplify the numerator. Simplify the denominator.	$x = \frac{3 \pm \sqrt{9-8}}{2}$ $x = \frac{3 \pm \sqrt{1}}{2}$ $x = \frac{3 \pm 1}{2}$	$x = \frac{-10 \pm \sqrt{100-60}}{6}$ $x = \frac{-10 \pm \sqrt{40}}{6}$
Step 5: Split your equation in two. Solve both.	$x = \frac{3+1}{2}$ $x = \frac{4}{2}$ $x = 2$ $x = \frac{3-1}{2}$ $x = \frac{2}{2}$ $x = 1$	$x = \frac{-10 + \sqrt{40}}{6}$ $x \approx -0.613$ $x = \frac{-10 - \sqrt{40}}{6}$ $x \approx -2.721$
Step 6: Check your solutions.	$(1)^2 - 3(1) + 2 = 0$ $0 = 0$ $(2)^2 - 3(2) + 2 = 0$ $0 = 0$	$3(-0.613)^2 + 10(-0.613) + 5 = 0$ $0 = 0$ $3(-2.721)^2 + 10(-2.721) + 5 = 0$ $0 = 0$

Finding the Coordinates for the Graph of a Quadratic Function

x	$f(x) =$ ____________________	$f(x)$	(x, y)

Graphing a Quadratic Function

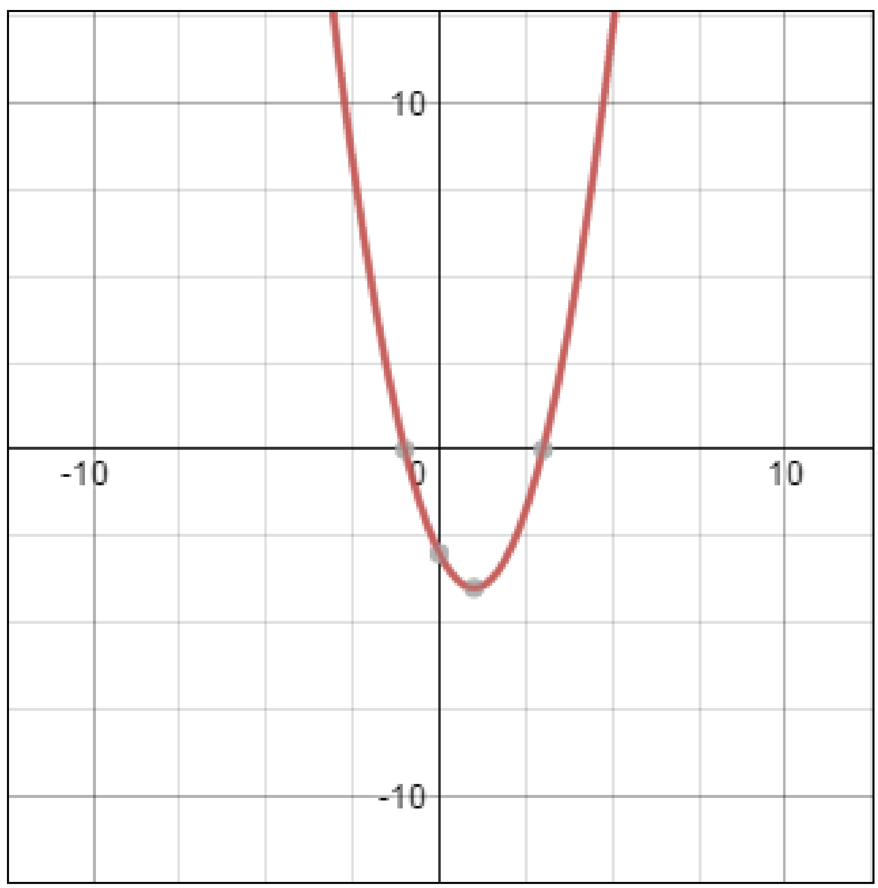


Finding the Coordinates for the Graph of a Quadratic Function

x	$f(x) = x^2 - 2x - 3$	$f(x)$	(x, y)
-2	$(-2)^2 - 2(-2) - 3$ $4 + 4 - 3 = 5$	5	$(-2,5)$
-1	$(-1)^2 - 2(-1) - 3$ $1 + 2 - 3 = 0$	0	$(-1,0)$
0	$(0)^2 - 2(0) - 3$ $0 - 0 - 3 = -3$	-3	$(0, -3)$
1	$(1)^2 - 2(1) - 3$ $1 - 2 - 3 = -4$	-4	$(1, -4)$
2	$(2)^2 - 2(2) - 3$ $4 - 4 - 3 = -3$	-3	$(2, -3)$

Graphing a Quadratic Function

$f(x) = x^2 - 2x - 3$	
x	f(x)
-2	5
-1	0
0	-3
1	-4
2	-3



Interactive Math Notebook
Review Activities

Example 1

Examples of Irrational Numbers

Example 2

Example 3

Directions:

1. Cut along the bold lines and fold along the dotted lines.
2. When you fold along the dotted line you will have a triangle flap book.
3. Flip up each flap and write your examples in the inside pages.
4. Insert your finished book into your math notebook.

Solving Quadratic Equations without Factoring

You can use this method when you have a second degree term and a zero degree term.

Step 1: Get your zero degree term on one side of the equation, and your second degree term on the other.

Step 2: If your second degree term has a coefficient, get rid of it using the multiplication or division principle.

Step 3: Take the square root of both sides in order to cancel out the square term. (This breaks the equation into two separate parts.)

Step 4: Solve for the variable.

Directions:

1. Cut along the bold lines and fold along the dotted lines.
2. Use a little bit of glue underneath the top flap to insert the flap book into your math notebook.
3. Flip up each flap and write your examples directly onto your math notebook page.

Solving Quadratic Equations without Factoring

You can use this method when you have a squared binomial and a zero degree term.

Step 1: Get your zero degree term on one side of the equation, and your squared binomial term on the other.

Step 2: Take the square root of both sides in order to cancel out the square term. (This breaks the equation into two separate parts.)

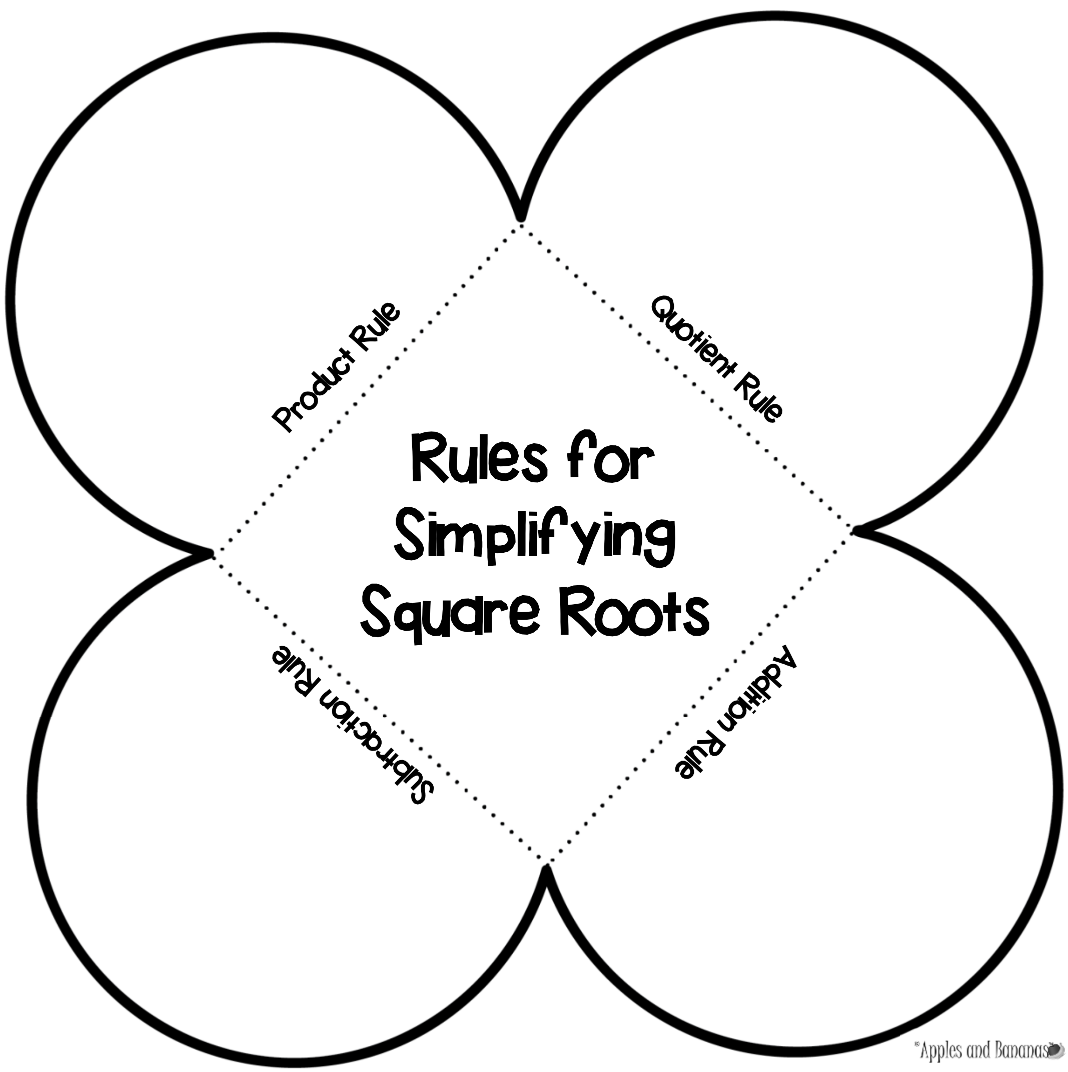
Step 3: Solve for the variable.

Directions:

1. Cut along the bold lines and fold along the dotted lines.
2. Use a little bit of glue underneath the top flap to insert the flap book into your math notebook.
3. Flip up each flap and write your examples directly onto your math notebook page.

Directions:

1. Cut along the bold lines and fold along the dotted lines.
2. When you fold along the dotted line you will have a petal flap book.
3. Glue the center of your petal book to your notebook page
4. Flip up each flap and write your examples directly in your math notebook.
5. Insert your finished book into your math notebook.



Square Roots in Simplest Radical Form

Step 1: Factor the term that is inside of your radical.

Step 2: Rewrite as many of the factors as you can as square terms.

Step 3: Let the square root cancel the square terms and keep the rest of the factors inside of the radicals.

Step 4: Simplify.

Directions:

1. Cut along the bold lines and fold along the dotted lines.
2. Use a little bit of glue underneath the top flap to insert the flap book into your math notebook.
3. Flip up each flap and write your examples directly onto your math notebook page.

Square Roots in Simplest Radical Form With Fractions

Step 1: Factor the term in your numerator and factor the term in your denominator.

Step 2: Rewrite as many of the factors as you can as square terms.

Step 3: Let the square root cancel the square terms and keep the rest of the factors inside of the radicals.

Step 4: If you still have a square root in your denominator you will need to rationalize the denominator.

Step 5: Simplify.

Directions:

1. Cut along the bold lines and fold along the dotted lines.
2. Use a little bit of glue underneath the top flap to insert the flap book into your math notebook.
3. Flip up each flap and write your examples directly onto your math notebook page.

Solving a Quadratic Equation by Completing the Square

Step 1: Move the number term to one side of the equation and keep your x^2 and x terms on the other.

Step 2: Make sure that the coefficient on your x^2 term is a 1.

Step 3: Find the number that will complete the square for the x^2 and x terms.

Step 4: Add the number from step 3 to both sides of the equation.

Step 5: Take the square root of both sides in order to cancel out the square term. (This breaks the equation into two separate parts.)

Step 6: Check your solutions.

Directions:

1. Cut along the bold lines and fold along the dotted lines.
2. Use a little bit of glue underneath the top flap to insert the flap book into your math notebook.
3. Flip up each flap and write your examples directly onto your math notebook page.

Solving a Quadratic Equation using the Quadratic Formula

Step 1: Rewrite your equation in standard form.

Step 2: Locate your a, b, and c values.

Step 3: Substitute your a, b, and c values in the Quadratic Formula.

Step 4: Simplify the numerator. Simplify the denominator.

Step 5: Split your equation in two. Solve both.

Step 6: Check your solutions.

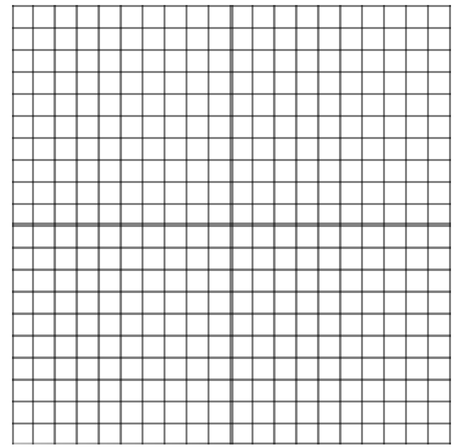
Directions:

1. Cut along the bold lines and fold along the dotted lines.
2. When you fold along the dotted line you will have a mini-book.
3. Flip up each flap and write your definitions and examples in the inside pages.
4. Insert your finished book into your math notebook.

Graphing a Quadratic Function

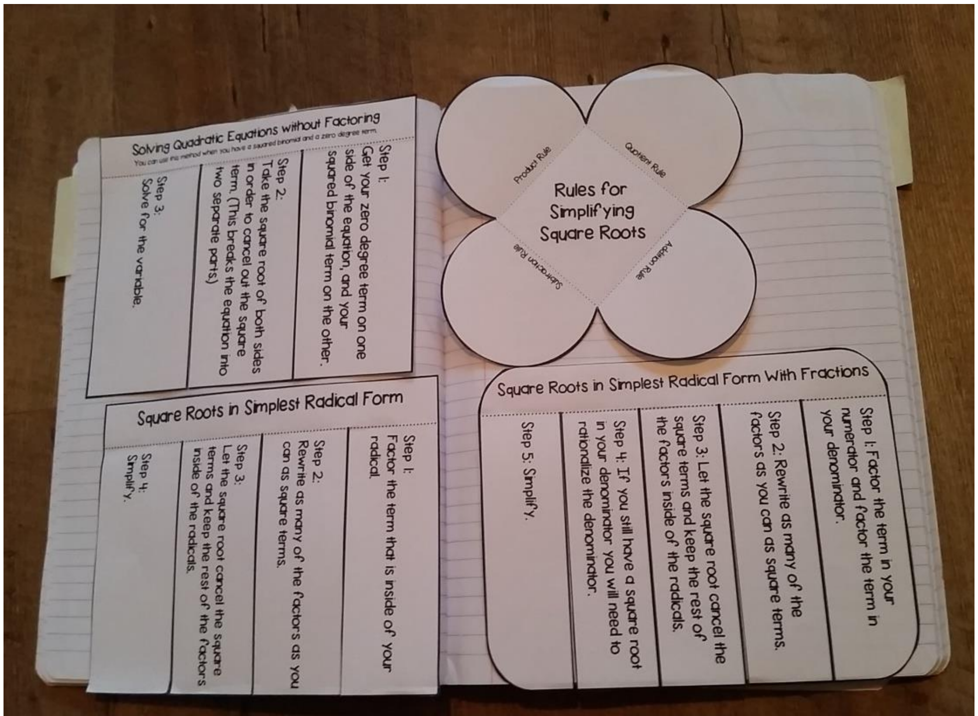
$f(x) =$ ______________

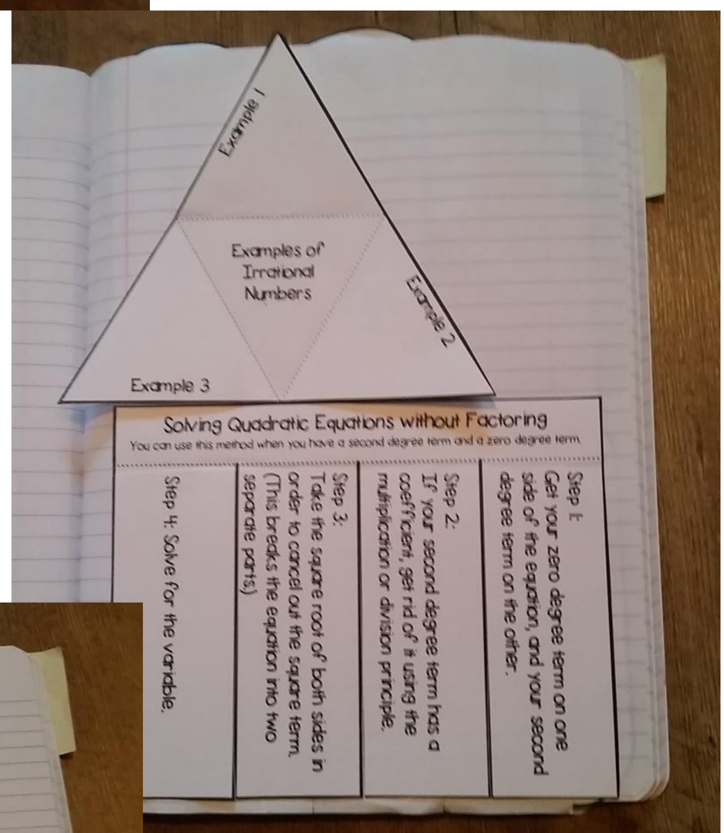
x	$f(x)$

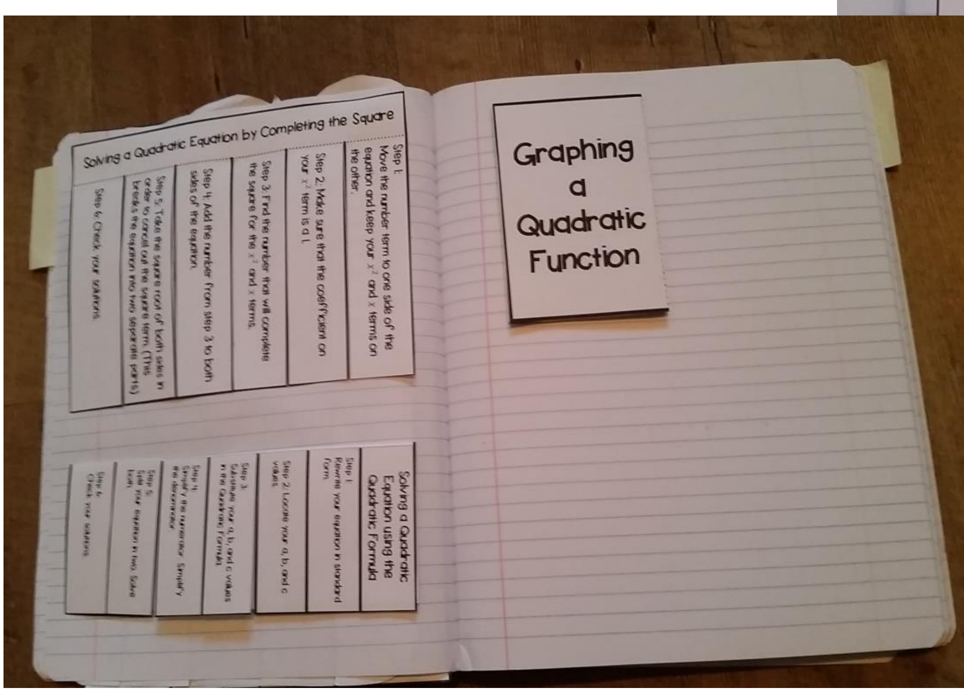


Glue this flap into your math journal.

INB SAMPLES


Solving Quadratic Equations without Factoring
Step 1: Get your zero degree term on one side of the equation, and your squared binomial term on the other.
Step 2: Take the square root of both sides in order to cancel out the square term. (This breaks the equation into two separate parts)
Step 3: Solve for the variable.
Rules for Simplifying Square Roots
Product Rule
Quotient Rule
Addition Rule
Subtraction Rule
Square Roots in Simplest Radical Form
Step 1: Factor the term that is inside of your radical.
Step 2: Rewrite as many of the factors as you can as square terms.
Step 3: Let the square root cancel the square terms and keep the rest of the factors inside of the radicals.
Step 4: Simplify.
Square Roots in Simplest Radical Form With Fractions
Step 1: Factor the term in your numerator and factor the term in your denominator.
Step 2: Rewrite as many of the factors as you can as square terms.
Step 3: Let the square root cancel the square terms and keep the rest of the factors inside of the radicals.
Step 4: If you still have a square root in your denominator you will need to rationalize the denominator.
Step 5: Simplify.


Example 1
Examples of Irrational Numbers
Example 2
Example 3
Solving Quadratic Equations without Factoring
You can use this method when you have a second degree term and a zero degree term.
Step 1: Get your zero degree term on one side of the equation, and your second degree term on the other.
Step 2: If your second degree term has a coefficient, get rid of it using the multiplication or division principle.
Step 3: Take the square root of both sides in order to cancel out the square term. (This breaks the equation into two separate parts)
Step 4: Solve for the variable.


Solving a Quadratic Equation by Completing the Square
Step 1: Move the number term to one side of the equation and keep your x² and x terms on the other.
Step 2: Make sure that the coefficient on your x² term is a 1.
Step 3: Find the number that will complete the square for the x² and x terms.
Step 4: Add the number from step 3 to both sides of the equation.
Step 5: Take the square root of both sides in order to cancel out the square term. (This breaks the equation into two separate parts)
Step 6: Check your solutions.
Graphing a Quadratic Function
Solving a Quadratic Equation using the Quadratic Formula

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