

keep scrolling to
get a sneak peek!

Help your Algebra students practice solving quadratic equations using the quadratic formula. Students will be eager to get the self-checking benefits from this circuit activity!

QUADRATIC FORMULA

Differentiated Circuit Worksheet

The image shows two overlapping worksheets titled "THE QUADRATIC FORMULA CIRCUIT". Each worksheet contains a set of directions and a grid of problem boxes. The directions state: "Directions: A circuit is a route that starts and ends at the same place. Start in the first box, solve the problem. Search through the remaining boxes for the answer you got. Complete that question. Continue until you have completed the questions and returned to the original question. Record your path below." Below the directions is a path of arrows: "1 → ___ → ___ → ___ → ___ → ___ → ___". The problem boxes are arranged in a grid. Each box contains a problem number, a problem statement, and a "Previous Answer" field. For example, one box contains: "1. Solve for x. Keep your answer in simplest radical form. $2x^2 + 3x - 2 = 0$ ". The "Previous Answer" field for this box is "x = 2, 3". Another box contains: "2. Solve for x. Keep your answer in simplest radical form. $3x^2 + 4x - 7 = 0$ ". The "Previous Answer" field for this box is "x = -4 ± √...". A third box contains: "3. Solve for x. Keep your answer in simplest radical form. $3x^2 + 4x - 7 = 0$ ". The "Previous Answer" field for this box is "x = 1, 3". A fourth box contains: "4. Solve for x. Keep your answer in simplest radical form. $2x^2 + 3x - 2 = 0$ ". The "Previous Answer" field for this box is "x = -5, ...".



2 versions + answer key included

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Why do you need this?

Quadratic Formula Circuit



It's self-checking! Your students will know if they are correct or not.



2 differentiated versions for all students practice this essential math skill.

Name: _____ Date: _____

EVALUATING FUNCTIONS FROM GRAPHS CIRCUIT

Directions: A circuit is a route that starts and ends at the same place. Start in the first box labeled 1 and solve the problem. Search through the remaining boxes for the answer you got for question 1. Now complete that question. Continue until you have completed the questions and you are back to the original question. Record your path below.

1 → _____ → _____ → _____ → _____ → _____

Previous Answer: $x = 4, f(-2) = 4$ # _____	2. Evaluate the function. $f(x) = 0, x = \underline{\hspace{2cm}}$ $f(2) = \underline{\hspace{2cm}}$
1. Evaluate the function. $f(x) = -2, x = \underline{\hspace{2cm}}$ $f(0) = \underline{\hspace{2cm}}$	
Previous Answer: $x = 0, f(5) = 0$ # _____	4. Evaluate the function. $f(x) = -3, x = \underline{\hspace{2cm}}$ $f(3) = \underline{\hspace{2cm}}$
3. Evaluate the function. $f(x) = 2, x = \underline{\hspace{2cm}}$ $f(-1) = \underline{\hspace{2cm}}$	
Previous Answer: $x = 1, f(2) = 6$ # _____	6. Evaluate the function. $f(x) = 5, x = \underline{\hspace{2cm}}$ $f(4) = \underline{\hspace{2cm}}$
5. Evaluate the function. $f(x) = -2, x = \underline{\hspace{2cm}}$	
Previous Answer: $x = -1, f(0) = 1$ # _____	7. Evaluate the function. $f(x) = -6, x = \underline{\hspace{2cm}}$ $f(5) = \underline{\hspace{2cm}}$
8. Evaluate the function. $f(x) = 4, x = \underline{\hspace{2cm}}$ $f(1) = \underline{\hspace{2cm}}$	
Previous Answer: $x = 0, f(-2) = 2$ # _____	9. Evaluate the function. $f(x) = -1, x = \underline{\hspace{2cm}}$ $f(-2) = \underline{\hspace{2cm}}$
10. Evaluate the function. $f(x) = -1, x = \underline{\hspace{2cm}}$ $f(-2) = \underline{\hspace{2cm}}$	
Challenge: Evaluate each function using the corresponding graphs.	

Quadratic Formula Circuit *includes:*

- ✓ 10 self-checking problems
- ✓ a detailed answer key
- ✓ a standard version with an extension question
- ✓ a basic version with helpful hints section
- ✓ student self assessment

Challenge: A free-falling object is dropped from a height of 50m. The equation for the height $h(t)$ at time t seconds is given by $h(t) = -4.9t^2 + 50$. At what time does the object reach a height of 10m? Use the quadratic formula to solve.

How are you feeling about this topic? Circle one:

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Helpful Hints: Use these hints to help you solve the problems.

The Quadratic Formula: $ax^2 + bx + c = 0$

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

How are you feeling about this topic? Circle one:

Quadratic Formula Circuit

standards covered:

CCSS: HSA-REI.B.4

TEKs: A2.4.F

VA SOLs: EI.AII.3.b

THE QUADRATIC FORMULA CIRCUIT

<p>Previous Answer: $x = 1/2$</p> <p>7. Solve for x. Keep your answer in simplest radical form. # 10</p> $x^2 + 8x + 10 = 0$ $x = \frac{-8 \pm \sqrt{(8)^2 - 4(1)(10)}}{2(1)}$ $x = \frac{-8 \pm \sqrt{64 - 40}}{2}$ $x = \frac{-8 \pm \sqrt{24}}{2}$ $x = \frac{-8 \pm 2\sqrt{6}}{2} \rightarrow x = -4 \pm \sqrt{6}$	<p>Previous Answer: $x = \frac{3 \pm \sqrt{14}}{5}$</p> <p>8. Solve for x. Keep your answer in simplest radical form. # 6</p> $2x^2 - 7x + 1 = 0$ $x = \frac{7 \pm \sqrt{(7)^2 - 4(2)(1)}}{2(2)}$ $x = \frac{7 \pm \sqrt{49 - 8}}{4}$ $x = \frac{7 \pm \sqrt{41}}{4}$
<p>Previous Answer: $x = -3, 1$</p> <p>9. Solve for x. Keep your answer in simplest radical form. # 1</p> $3x^2 + 4x + 1 = 0$ $x = \frac{-4 \pm \sqrt{(4)^2 - 4(3)(1)}}{2(3)}$ $x = \frac{-4 \pm \sqrt{16 - 12}}{6}$ $x = \frac{-4 \pm \sqrt{4}}{6}$ $x = \frac{-4 \pm 2}{6} \rightarrow x = \frac{-2 \pm 1}{3} \rightarrow x = -1, -\frac{1}{3}$	<p>Previous Answer: $x = 2 \pm 2\sqrt{3}$</p> <p>10. Solve for x. Keep your answer in simplest radical form. # 5</p> $4x^2 - 4x + 1 = 0$ $x = \frac{4 \pm \sqrt{(-4)^2 - 4(4)(1)}}{2(4)}$ $x = \frac{4 \pm \sqrt{16 - 16}}{8}$ $x = \frac{4 \pm 0}{8}$ $x = \frac{1}{2}$

Challenge: A free-falling object is dropped from a height of 50m. The equation for the height $h(t)$ at time t seconds is given by $h(t) = -4.9t^2 + 50$. At what time does the object reach a height of 10m? Use the quadratic formula to solve.

$$10 = -4.9t^2 + 50$$
$$-10 = -4.9t^2 - 10$$
$$0 = -4.9t^2 + 40$$
$$t = \frac{-0 \pm \sqrt{(0)^2 - 4(-4.9)(40)}}{2(-4.9)}$$

how this circuit resource works

Then search for their answer on the worksheet. Once the answer is found, students complete the problem below it.

Students can track their path at the top.

Name: _____ Date: _____

THE QUADRATIC FORMULA CIRCUIT

Directions: A circuit is a route that starts and ends at the same place. Start in the first box labeled 1 and solve the problem. Search through the remaining boxes for the answer you got for question 1. Now complete that question. Continue until you have completed the questions and you are back to the original question. Record your path below.

1 → _____ → _____ → _____ → _____ → _____ → _____ → _____ → _____ → _____ → 1

Previous Answer: $x = 2, 3$ # _____	Previous Answer: $s = -2/5, 1$ # _____
1. Solve for x . Keep your answer in simplest radical form. $2x^2 + 3x - 2 = 0$	2. Solve for x . Keep your answer in simplest radical form. $x^2 - 5x + 6 = 0$
Previous Answer: $x = 1, 3$ # _____	Previous Answer: $x = -5, -2$ # _____
3. Solve for x . Keep your answer in simplest radical form. $3x^2 + 4x - 7 = 0$	4. Solve for x . Keep your answer in simplest radical form. $2x^2 - 8x + 6 = 0$

Students start with the first question.

The last question they answer should lead back to problem #1 to "close" the circuit.

how to use this resource

Name: **Answer Key** Date: _____

THE QUADRATIC FORMULA CIRCUIT

Directions: A circuit is a route that starts and ends at the same place. Start in the first box labeled 1 and solve the problem. Search through the remaining boxes for the answer you got for question 1. Now complete that question. Continue until you have completed the questions and you are back to the original question. Record your path below.

1 → 9 → 6 → 8 → 4 → 3 → 5 → 10 → 7 → 2 → 1

Previous Answer: $x = \frac{-2 \pm \sqrt{7}}{3}$ # 2	Previous Answer: $x = -4 \pm \sqrt{6}$ # 7
---	---

1. Solve for x. Keep your answer in simplest radical form. $x^2 + 2x - 3 = 0$

$$x = \frac{-2 \pm \sqrt{(2)^2 - 4(1)(-3)}}{2(1)}$$

$$x = \frac{-2 \pm \sqrt{4 + 12}}{2}$$

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

$$x = \frac{-2 \pm 4}{2}$$

$$x = -1 \pm 2 \rightarrow \boxed{x = -3}$$

Previous Answer: $x = -3, 1/2$

3. Solve for x. Keep your answer in simplest radical form. $x^2 - 6x - 7 = 0$

$$x = \frac{6 \pm \sqrt{(-6)^2 - 4(1)(-7)}}{2(1)}$$

$$x = \frac{6 \pm \sqrt{36 + 28}}{2}$$

$$x = \frac{6 \pm \sqrt{64}}{2}$$

$$x = \frac{6 \pm 8}{2} \rightarrow \boxed{x = 7}$$

Previous Answer: $x = -1, 7$

5. Solve for x. Keep your answer in simplest radical form. $x^2 - 4x - 8 = 0$

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

$$x = \frac{4 \pm \sqrt{16 + 32}}{2}$$

$$x = \frac{4 \pm \sqrt{48}}{2}$$

THE QUADRATIC FORMULA CIRCUIT

Previous Answer: $x = 3, 6$ # 10	Previous Answer: $x = -3/2$ # 6
---	--

7. Solve for x. Keep your answer in simplest radical form. $5x^2 - 3x - 2 = 0$

$$x = \frac{3 \pm \sqrt{(-3)^2 - 4(5)(-2)}}{2(5)}$$

$$x = \frac{3 \pm \sqrt{9 + 40}}{10}$$

$$x = \frac{3 \pm \sqrt{49}}{10}$$

$$x = \frac{3 \pm 7}{10} \rightarrow \boxed{x = -2/5, 1}$$

Previous Answer: $x = -2, 1/2$ # **1**

9. Solve for x. Keep your answer in simplest radical form. $6x^2 - 11x + 3 = 0$

$$x = \frac{11 \pm \sqrt{(-11)^2 - 4(6)(3)}}{2(6)}$$

$$x = \frac{11 \pm \sqrt{121 - 72}}{12}$$

$$x = \frac{11 \pm \sqrt{49}}{12}$$

$$x = \frac{11 \pm 7}{12} \rightarrow \boxed{x = 1/3, 3/2}$$

Previous Answer: $x = -6, 2$ # **5**

10. Solve for x. Keep your answer in simplest radical form. $x^2 - 9x + 18 = 0$

$$x = \frac{9 \pm \sqrt{(-9)^2 - 4(1)(18)}}{2(1)}$$

$$x = \frac{9 \pm \sqrt{81 - 72}}{2}$$

$$x = \frac{9 \pm \sqrt{9}}{2}$$

$$x = \frac{9 \pm 3}{2} \rightarrow \boxed{x = 3, 6}$$

This is a great activity to use when reviewing how evaluate functions when given a scatter plot, linear function, or exponential function.

It can be used right after teaching the concept or as homework.

This is also a **substitute-friendly** assignment!

You may also enjoy ...

QUADRATIC FORMULA

Algebra 2 Guided Notes

THE QUADRATIC FORMULA

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

Steps for Using the Quadratic Formula

Step 1: Rewrite the quadratic equation in standard form.

Step 2: Identify the values for a, b, and c and plug them into the quadratic formula.

Step 3: Evaluate the quadratic formula to solve for x.

Directions: Solve each quadratic equation using the quadratic formula. Leave your answer in simplest radical or fraction form.

$x^2 + 3x = 5$
 $x^2 + 3x - 5 = 0$
 $a = 1, b = 3, c = -5$

$25x^2 - 8x = 11$
 $25x^2 - 8x - 11 = 0$
 $a = 25, b = -8, c = -11$

Answer key included

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QUADRATICS

Digital Activity Bundle

Algebra

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QUADRATICS & COMPLEX NUMBERS

Algebra 2 Guided Notes

COMPLETING THE SQUARE

Directions: Solve each quadratic equation by completing the square.

$x^2 + 6x + 5 = 0$

$25x^2 - 8x - 11 = 0$

SOLVING QUADRATIC EQUATIONS BY FACTORING

Directions: Solve the quadratic equation by factoring.

$x^2 - 4x - 12 = 0$
 $x^2 - 4x + 4 - 12 - 4 = 0$
 $(x - 2)^2 - 16 = 0$
 $(x - 2)^2 = 16$
 $x - 2 = \pm 4$
 $x = 2 \pm 4$
 $x = -2, 6$

WRITING QUADRATIC EQUATIONS IN STANDARD FORM

Directions: Write the equation of the parabola in standard form.

Write an equation of the parabola that passes through the points (-1, 4), (0, 1), and (2, 7).

Equation: $y = x^2 + 2x + 5$

Answer key included

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check it out!

Answer Key
Name: _____ Date: _____
ADDING & SUBTRACTING RATIONAL EXPRESSIONS
Directions: Simplify each rational expression. Show your work.

Solving Systems of Equations
Date: _____
Solve each system of equations using substitution or elimination. Check your solution.
2. $2x - 6y = -18$
 $x = 3y - 9$
4. $2x + 6y = -1$
 $y = -2x + 3$

Answer Key
Date: _____
Solving Systems of Equations
Solve each system of equations using substitution or elimination. Check your solution.
2. $2x - 6y = -18$
 $x = 3y - 9$
 $2(3y - 9) - 6y = -18$
 $6y - 18 - 6y = -18$
 $-18 = -18$
infinitely many solutions
4. $2x + 6y = -1$
 $y = -2x + 3$
 $2x + 6(-2x + 3) = -1$
 $2x - 12x + 18 = -1$
 $-10x + 18 = -1$
 $-10x = -19$
 $x = 1.9$
 $y = -2(1.9) + 3 = -3.8 + 3 = -0.8$
 $(1.9, -0.8)$

Multiplying & Dividing Rational Expressions
Date: _____
Directions: Multiply or divide the rational expressions. Show your work.

Rational Expression Operations - Addition & Subtraction
Directions: Answer each question and type the question number with the matching answer in the answer column to the right.

#	Question	Answer	Type the matching question numbers here
1	$\frac{5}{x} + \frac{3}{x+1}$	$\frac{2x+1}{x+2}$	
2	$\frac{2}{x+4} - \frac{x^2}{x^2-16}$	$-\frac{1}{x^2-1}$	
3	$\frac{x+2}{x^2+4x+4} + \frac{2x}{x+2}$	$\frac{2x^2+2x+5}{x^2+x-2}$	
4	$\frac{x}{x-2} + \frac{3}{x-1}$	$-\frac{x^2+2x-8}{x^2-16}$	
5	$\frac{x}{4x+8} - \frac{1}{x^2+2x}$	$\frac{8x+5}{x^2+1}$	
6	$\frac{x+2}{x-1} + \frac{x-1}{x+2}$	$\frac{x^2-3x+7}{x^2-4}$	
7	$\frac{2x+1}{x^2-4} + \frac{x-3}{x+2}$	$\frac{x^2+2x-6}{x^2-3x+2}$	
8	$\frac{x^2+2x}{x^2-1} - \frac{x+1}{x-1}$	$\frac{x-2}{4x}$	

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hey there!

My name is Malia and I'm passionate about making learning and practicing math fun. I love creating engaging math resources for my students and I hope your students enjoy this activity too!

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