

keep scrolling to
get a sneak peek!

Help your Algebra students practice writing quadratic equations in standard form given three points. Students will be eager to get the self-checking benefits from this circuit activity!

WRITING QUADRATICS IN STANDARD FORM

Differentiated circuit worksheet

Date: _____

WRITING QUADRATIC EQUATIONS IN STANDARD FORM

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

1 → 6 → 2 → 3 → 8 → 7 → 4

Previous Answer: $y = -x^2 - 3x + 6$ # 5

1. Write a quadratic equation in standard form that goes through the points $(-3, -3)$, $(0, -6)$.

$$\begin{aligned} -3 &= 9a - 3b - 6 & -3 &= a + b - 6 \\ +6 & & +6 & \\ 3 &= 9a - 3b & 3 &= a + b \\ +9 &= 3a + 3b & 9 &= 3a + 3b \\ \hline 12 &= 12a & & \\ 12 & & & \\ \hline a &= 1 & & \\ 3 &= 1 + b & & \\ -1 & & & \\ -1 & & & \\ \hline 2 &= b & & \\ \hline c &= -6 & & \end{aligned}$$

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

2. Write a quadratic equation that goes through the points $(1, 1)$, $(2, 4)$, $(3, 9)$.

$$\begin{aligned} -1 &= a + b - 4 & 2 &= 4 \\ +4 & & +4 & \\ 3 &= a + b & 6 &= 4 \\ +9 &= 3a + 3b & \rightarrow & +6 = 2 \\ \hline 12 &= 6a & & \\ 12 & & & \\ \hline 2 &= a & & \\ 3 &= 2 + b & & \\ -2 & & & \\ -2 & & & \\ \hline 1 &= b & & \\ \hline 4 &= 2c & & \end{aligned}$$


2 versions + answer key included

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Why do you need this?

Writing Quadratic Equations in Standard Form 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: _____

WRITING QUADRATIC EQUATIONS IN STANDARD FORM 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: $y = x^2 + 4x + 10$ # _____	Previous Answer: $y = x^2 - 2$ # _____
1. Write a quadratic equation in standard form that goes through the points (1, 1), (2, 4), (3, 9).	5. Write a quadratic equation in standard form that goes through the points (-1, 2), (0, 6), (1, 8).
Previous Answer: $y = 2x^2 + 3x + 1$ # _____	Previous Answer: $y = x^2 - 7x + 6$ # _____
3. Write a quadratic equation in standard form that goes through the points (1, 2), (3, 10), (5, 26).	7. Write a quadratic equation in standard form that goes through the points (0, -12), (1, -5), (3, 3).
Previous Answer: $y = x^2 - 2x - 6$ # _____	Previous Answer: $y = -3x^2 + 8x$ # _____
2. Write that goes through the points (1, 1), (2, 4), (3, 9).	6. Write a quadratic equation in standard form that goes through the points (-2, -6), (0, 2), (2, 2).
4. Write that goes through the points (2, 10).	8. Write a quadratic equation in standard form that goes through the points (1, 1), (2, 2), (3, 3).

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

Helpful steps:

- 1) Substitute the coordinates into their own standard form
- 2) Create a system of equations
- 3) Solve the system
- 4) Use the values to write the equation

Form: $y = ax^2 + bx + c$

Quadratic Equations in Standard Form *includes:*

Challenge: A ball is thrown and its height in meters is modeled by a quadratic function. The ball reaches its maximum height of 10m at 2 seconds, and after 4 seconds, it lands on the ground. Write the quadratic equation that models the ball's height over time in standard form.	
How are you feeling about this topic? Circle one: <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>	
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Helpful Hints: Use these hints to help you solve the problems.	
Standard Form: $y = ax^2 + bx + c$ Point: (x, y)	Helpful steps: <ol style="list-style-type: none">1) Substitute the coordinates of each coordinate into their own standard form equation.2) Create a system of equations.3) Solve the system of equations.4) Use the values you found from the system and substitute them back into the standard form equation.
How are you feeling about this topic? Circle one: <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>	
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- ✓ 8 self-checking problems
- ✓ a detailed answer key
- ✓ a standard version with an extension question
- ✓ a basic version with helpful hints section
- ✓ student self assessment

Quadratic Equations in Standard Form

standards covered:

CCSS: HSA-CED.A.2, HSF-IF.C.7

TEKs: A1.7.A

VA SOLs: F.A.7.b, F.A.7.f

WRITING QUADRATIC EQUATIONS IN STANDARD FORM CIRCUIT

Previous Answer: $y = x^2 + x + 4$ # **4**

5. Write a quadratic equation in standard form that goes through the points $(-2, 6)$, $(1, 15)$, $(3, 31)$.

$6 = 4a - 2b + c$
 $15 = a + b + c$
 $31 = 9a + 3b + c$
 $2(15 = a + b + c)$
 $30 = 2a + 2b + 2c$
 $+6 = 4a - 2b + c$
 $36 = 6a + 3c$
 $36 = 6a + 3(10)$
 $36 = 6a + 30$
 $-6 = 6a - 30$
 $-1 = a$
 $a = 1$

$-3(15 = a + b + c)$
 $-45 = -3a - 3b - 3c$
 $31 = 9a + 3b + c$
 $-14 = 6a - 2c$
 $-36 = 6a + 3c$
 $-50 = -5c$
 $-10 = -5c$
 $2 = c$
 $15 = 1 + b + 10$
 $15 = 11 + b$
 $-11 = -11 + b$
 $0 = b$
 $b = 0$

$y = x^2 + 4x + 10$

Previous Answer: $y = x^2$ # **1**

6. Write a quadratic equation in standard form that goes through the points $(2, 1)$, $(4, 9)$, $(6, 25)$.

$1 = 4a + 2b + c$
 $9 = 16a + 4b + c$
 $25 = 36a + 6b + c$
 $-4(1 = 4a + 2b + c)$
 $-4 = -16a - 8b - 4c$
 $9 = 16a + 4b + c$
 $5 = -4b - 3c$
 $-3(5 = -4b - 3c)$
 $-15 = 12b + 9c$
 $-9 = 12b + 9$
 $-9 = 12b + 9$
 $-24 = 12b$
 $-2 = b$

$-9(1 = 4a + 2b + c)$
 $-9 = -36a - 18b - 9c$
 $+25 = 36a + 6b + c$
 $16 = -12b - 8c$
 $-15 = 12b + 9c$
 $1 = 12c$
 $1 = 12c$
 $c = 1$

$1 = 4a + 2(-2) + 1$
 $1 = 4a - 4 + 1$
 $1 = 4a - 3$
 $+3 = 4a - 3$
 $4 = 4a$
 $1 = a$
 $a = 1$

$y = x^2 - 2x + 1$

Previous Answer: $y = x^2 + 3x + 2$ # **8**

7. Write a quadratic equation in standard form that goes through the points $(0, 3)$, $(1, -4)$, $(2, -9)$.

$-4 = a + b + c$
 $-3 = a + b + c$
 $-7 = a + b$
 $-2(-7 = a + b)$
 $14 = -2a - 2b$
 $-7 = 1 + b$
 $-8 = b$
 $b = -8$

$-9 = 4a + 2b + c$
 $-3 = 4a + 2b + c$
 $-12 = 4a + 2b$
 $+14 = -2a - 2b$
 $2 = 2a$
 $1 = a$
 $a = 1$

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

Previous Answer: $y = x^2 + 1$ # **3**

8. Write a quadratic equation in standard form that goes through the points $(0, 2)$, $(1, 6)$, $(2, 12)$.

$6 = a + b + c$
 $-2 = a + b + c$
 $4 = a + b$
 $-2(4 = a + b)$
 $-8 = -2a - 2b$
 $4 = 1 + b$
 $3 = b$
 $b = 3$

$12 = 4a + 2b + c$
 $-2 = 4a + 2b + c$
 $10 = 4a + 2b$
 $-8 = -2a - 2b$
 $2 = 2a$
 $1 = a$
 $a = 1$

$y = x^2 + 3x + 2$

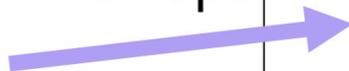
Challenge: A ball is thrown and its height in meters is modeled by a quadratic equation that reaches its maximum height of 10m at 2 seconds, and after 11 seconds the quadratic equation that models the ball's height is $y = x^2 + 3x + 2$.

vertex: $(2, 10)$

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.



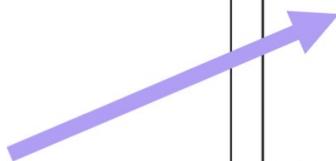
Name: _____ Date: _____

WRITING QUADRATIC EQUATIONS IN STANDARD FORM 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: $y = x^2 + 4x + 10$ # ____	Previous Answer: $y = x^2 - 2x + 1$ # ____
1. Write a quadratic equation in standard form that goes through the points (1, 1), (2, 4), (3, 9).	2. Write a quadratic equation in standard form that goes through the points (-2, 3), (-1, 0), (1, 6).
Previous Answer: $y = 2x^2 + 3x + 1$ # ____	Previous Answer: $y = x^2 - 8x + 3$ # ____
3. Write a quadratic equation in standard form that goes through the points (1, 2), (3, 10), (5, 26).	4. Write a quadratic equation in standard form that goes through the points (-1, 4), (1, 6), (2, 10).



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

This is a great activity to use when reviewing how to write quadratic equations in vertex form.

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

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

Name: **Answer Key** Date: _____

WRITING QUADRATIC EQUATIONS IN STANDARD FORM 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 → **6** → **2** → **3** → **8** → **7** → **4** → **5** → 1

Previous Answer: $y = x^2 + 4x + 10$ # 5	Previous Answer: $y = x^2 - 2x + 1$ # 6
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1. Write a quadratic equation in standard form that goes through the points (1, 1) and (2, 2).

$1 = a + b + c$
 $4 = 4a + 2b + c$
 $9 = 9a + 3b + c$
 $-2(1 = a + b + c)$
 $-2 = -2a - 2b - 2c$
 $+4 = 4a + 2b + c$
 $2 = 2a - c$
 $-3(1 = a + b + c)$
 $-3 = -3a - 3b - 3c$
 $+9 = 9a + 3b + c$
 $6 = 6a - 2c$

$1 = 1 + b + c$
 $0 = b + c$

2. Write a quadratic equation in standard form that goes through the points (2, 1) and (4, 9).

$1 = a + b + c$
 $9 = 4a + 2b + c$
 $-9(1 = a + b + c)$
 $-9 = -9a - 9b - 9c$
 $+25 = 36a + 6b + c$
 $16 = -12b - 8c$
 $-4(1 = a + b + c)$
 $-4 = -4a - 4b - 4c$
 $9 = 16a + 4b + c$
 $5 = -4b - 3c$
 $-3(5 = -4b - 3c)$
 $-15 = 12b + 9c$

$1 = 1c$ $c = 1$
 $1 = 4a + 2(-2) + 1$
 $1 = 4a - 4 + 1$
 $1 = 4a - 3$
 $4 = 4a$
 $1 = a$

3. Write a quadratic equation in standard form that goes through the points (5, 26) and (10, 31).

$2 = a + b + c$
 $10 = 9a + 3b + c$
 $26 = 25a + 5b + c$
 $-3(2 = a + b + c)$
 $-6 = -3a - 3b - 3c$
 $+10 = 9a + 3b + c$
 $4 = 6a - 2c$
 $-2(4 = 6a - 2c)$
 $-8 = -12a + 4c$
 $-8 = -12a + 4c$
 $+2 + 12$

$-5(2 = a + b + c)$
 $-10 = -5a - 5b - 5c$
 $26 = 25a + 5b + c$
 $-8 = -12a + 4c$
 $8 = 8a - 4c$

$2 = 1 + b + c$
 $2 = 2 + b$
 $0 = b$

4. Write a quadratic equation in standard form that goes through the points (-2, 6) and (1, 15).

$6 = 4a - 2b + c$
 $15 = a + b + c$
 $31 = 9a + 3b + c$
 $2(15 = a + b + c)$
 $30 = 2a + 2b + 2c$
 $+6 = 4a - 2b + c$
 $36 = 6a + 3c$
 $36 = 6a + 3(10)$
 $36 = 6a + 30$
 $6 = 6a - 30$

$-3(15 = a + b + c)$
 $-45 = -3a - 3b - 3c$
 $31 = 9a + 3b + c$
 $-14 = 6a - 2c$
 $-(36 = 4a + 3c)$
 $-50 = -5c$
 $c = 10$
 $6 = 6a$
 $15 = 1 + b + 10$
 $15 = 11 + b$
 $4 = b$
 $4 = x^2 + 4x + 10$

5. Write a quadratic equation in standard form that goes through the points (2, 1) and (4, 9).

$1 = 4a + 2b + c$
 $9 = 16a + 4b + c$
 $25 = 36a + 6b + c$
 $-4(1 = 4a + 2b + c)$
 $-4 = -16a - 8b - 4c$
 $9 = 16a + 4b + c$
 $5 = -4b - 3c$
 $-3(5 = -4b - 3c)$
 $-15 = 12b + 9c$

$-9(1 = 4a + 2b + c)$
 $-9 = -36a - 18b - 9c$
 $+25 = 36a + 6b + c$
 $16 = -12b - 8c$
 $-15 = 12b + 9c$

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

6. Write a quadratic equation in standard form that goes through the points (0, 2) and (1, 6).

$2 = a + b + c$
 $6 = a + b + c$
 $-2(2 = a + b + c)$
 $-4 = -2a - 2b - 2c$
 $6 = a + b + c$
 $10 = 4a + 2b + c$
 $-2(4 = a + b + c)$
 $-8 = -2a - 2b - 2c$
 $10 = 4a + 2b + c$
 $2 = 2a$
 $1 = a$

7. Write a quadratic equation in standard form that goes through the points (0, 3) and (1, -4).

$3 = a + b + c$
 $-4 = a + b + c$
 $-2(-4 = a + b + c)$
 $8 = 2a + 2b + 2c$
 $3 = a + b + c$
 $11 = 3a + 3b + 3c$
 $-11 = -11a - 11b - 11c$
 $4 = b$
 $4 = x^2 + 4x + 10$

$-9 = 4a + 2b + c$
 $-3 = -3a - 3b - 3c$
 $-12 = 4a + 2b + c$
 $+14 = -2a - 2b - 2c$
 $2 = 2a$
 $1 = a$

8. Write a quadratic equation in standard form that goes through the points (0, 2), (1, 6), (2, 12), and (3, 18).

$2 = a + b + c$
 $6 = a + b + c$
 $12 = 4a + 2b + c$
 $18 = 9a + 3b + c$
 $-2(2 = a + b + c)$
 $-4 = -2a - 2b - 2c$
 $6 = a + b + c$
 $10 = 4a + 2b + c$
 $-2(4 = a + b + c)$
 $-8 = -2a - 2b - 2c$
 $10 = 4a + 2b + c$
 $2 = 2a$
 $1 = a$

8. Write a quadratic equation in standard form that goes through the points (0, 2), (1, 6), (2, 12), and (3, 18).

$2 = a + b + c$
 $6 = a + b + c$
 $12 = 4a + 2b + c$
 $18 = 9a + 3b + c$
 $-2(2 = a + b + c)$
 $-4 = -2a - 2b - 2c$
 $6 = a + b + c$
 $10 = 4a + 2b + c$
 $-2(4 = a + b + c)$
 $-8 = -2a - 2b - 2c$
 $10 = 4a + 2b + c$
 $2 = 2a$
 $1 = a$

Previous Answer: $y = x^2 + 3x + 2$ # **8**

Previous Answer: $y = x^2 + 1$ # **3**

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check it out!

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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