



Why do you need this?

# Writing Quadratic Equations in Intercept 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 INTERCEPT 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: $y = 2(x - 2)(x - 5)$ # _____	2. Write that goes intercept	Previous Answer: $y = 1/2(x + 1)(x - 3)$ # _____
1. Write a quadratic equation in intercept form that goes through the point (3, 12) and has intercepts at (1, 0) and (-2, 0).		7. Write a quadratic equation in intercept form that goes through the point (-2, 4) and has intercepts at (0, 0) and (-4, 0).
Previous Answer: $y = -2x(x + 4)$ # _____	4. Write that goes intercept	Previous Answer: $y = x(x - 5)$ # _____
3. Write a quadratic equation in vertex form that goes through the point (4, 2) and has a vertex of (3, 0) and (5, 0).		10. Write a quadratic equation in intercept form that goes through the point (1, -4) and has intercepts at (-3, 0) and (2, 0).
Previous Answer: $y = 2x(x + 4)$ # _____	6. Write that goes intercept	
5. Write a quadratic equation in intercept form that goes through the point (0, -4) and has intercepts at (-1, 0) and (2, 0).		

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

Intercept Form:  $y = a(x - p)(x - a)$   
x intercept: (p, 0) & (a, 0)

Helpful steps:

- 1) Substitute the given information into the equation.
- 2) Use the additional information to solve for the unknown.
- 3) Write the final equation using the given information you found.

# Quadratic Equations in Intercept Form *includes:*

Challenge: Given the following three points: (-6, 0), (2, 0), and (0, 48). Write the quadratic equation in intercept form. Then use your equation to find the axis of symmetry and the vertex of the parabola.

How are you feeling about this topic? Circle one:

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Intercept Form:  $y = a(x - p)(x - q)$

X-intercept:  $(p, 0)$  &  $(q, 0)$

Point:  $(x, y)$

Helpful steps:

- 1) Substitute the given intercepts into the equation.
- 2) Use the additional point to substitute into the equation & solve for a.
- 3) Write the final quadratic equation using the given information and values that you found.

How are you feeling about this topic? Circle one:

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- ✓ 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

# Quadratic Equations in Intercept Form

standards covered:

**CCSS:** HSA-CED.A.2

**TEKs:** A2.4.B

**VA SOLs:** EI.A11.3.b

**WRITING QUADRATIC EQUATIONS IN INTERCEPT FORM CIRCUIT**

Previous Answer:  $y = -2(x-3)(x-5)$  # 3

7. Write a quadratic equation in intercept form that goes through the point (1, 6) and has intercepts at (-2, 0) and (4, 0).  
 $6 = a(1+2)(1-4)$   
 $6 = a(3)(-3)$   
 $6 = -9a$   
 $\frac{6}{-9} = \frac{-9a}{-9}$   
 $a = -\frac{2}{3}$   
 $y = -\frac{2}{3}(x+2)(x-4)$

Previous Answer:  $y = x(x-6)$  # 6

8. Write a quadratic equation in intercept form that goes through the point (-1, -4) and has intercepts at (-3, 0) and (1, 0).  
 $-4 = a(-1+3)(-1-1)$   
 $-4 = a(2)(-2)$   
 $-4 = -4a$   
 $\frac{-4}{-4} = \frac{-4a}{-4}$   
 $a = 1$   
 $y = (x+3)(x-1)$

Previous Answer:  $y = -\frac{2}{3}(x+2)(x-4)$  # 7

9. Write a quadratic equation in intercept form that goes through the point (3, -4) and has intercepts at (2, 0) and (5, 0).  
 $-4 = a(3-2)(3-5)$   
 $-4 = a(1)(-2)$   
 $-4 = -2a$   
 $\frac{-4}{-2} = \frac{-2a}{-2}$   
 $2 = a$   
 $y = 2(x-2)(x-5)$

Previous Answer:  $y = -(x+6)(x+2)$  # 4

10. Write a quadratic equation in intercept form that goes through the point (-2, -8) and has intercepts at (0, 0) and (-4, 0).  
 $-8 = a(-2-0)(-2+4)$   
 $-8 = a(-2)(2)$   
 $-8 = -4a$   
 $\frac{-8}{-4} = \frac{-4a}{-4}$   
 $2 = a$   
 $y = 2x(x+4)$

Challenge: Given the following three points: (-6, 0), (2, 0), and (0, 48). Write the quadratic equation in intercept form. Then use your equation to find the axis of symmetry and the vertex of the parabola.  
 $48 = a(0+6)(0-2)$   
 $48 = a(6)(-2)$   
 $48 = -12a$   
 $\frac{48}{-12} = \frac{-12a}{-12}$   
 $-4 = a$   
AOS:  $x = \frac{-6+2}{2}$   
 $x = -2$   
 $y = 48$

# 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 INTERCEPT 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: $y = 2(x - 2)(x - 5)$ # _____	Previous Answer: $y = 2(x + 1)(x - 2)$ # _____
1. Write a quadratic equation in intercept form that goes through the point (3, 12) and has intercepts at (1, 0) and (-2, 0).	2. Write a quadratic equation in intercept form that goes through the point (-2, 8) and has intercepts at (-4, 0) and (0, 0).
Previous Answer: $y = -2x(x + 4)$ # _____	Previous Answer: $y = (x + 3)(x - 1)$ # _____
3. Write a quadratic equation in vertex form that goes through the point (4, 2) and has a vertex of (3, 0) and (5, 0).	4. Write a quadratic equation in intercept form that goes through the point (-4, 4) and has intercepts at (-6, 0) and (-2, 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

This is a great activity to use when reviewing how to write quadratic equations in intercept 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 INTERCEPT 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** → **8** → **4** → **10** → **5** → **2** → **3** → **7** → **9** → 1

Previous Answer: $y = 2(x - 2)(x - 5)$ # <b>9</b>	Previous Answer: $y = 2(x + 1)(x - 2)$ # <b>5</b>
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1. Write a quadratic equation in intercept form that goes through the point (3, 12) and has intercepts at (1, 0) and (-2, 0).  
 $12 = a(3-1)(3+2)$   
 $12 = a(2)(5)$   
 $12 = 10a$   
 $\frac{12}{10} = a$   
 $\frac{6}{5} = a$   
 **$y = \frac{6}{5}(x-1)(x+2)$**

Previous Answer:  $y = -2x(x + 5)$

3. Write a quadratic equation in intercept form that goes through the point (4, 2) and has vertex at (3, 0) and (5, 0).  
 $2 = a(4-3)(4-5)$   
 $2 = a(1)(-1)$   
 $2 = -a$   
 $\frac{2}{-1} = -a$   
 $-2 = a$   
 **$y = -2(x-3)(x-5)$**

Previous Answer:  $y = 2x(x + 5)$

5. Write a quadratic equation in intercept form that goes through the point (0, -4) and has intercepts at (-1, 0) and (2, 0).  
 $-4 = a(0+1)(0-2)$   
 $-4 = a(1)(-2)$   
 $-4 = -2a$   
 $\frac{-4}{-2} = a$   
 $2 = a$   
 **$y = 2(x+1)(x-2)$**

### WRITING QUADRATIC EQUATIONS IN INTERCEPT FORM CIRCUIT

Previous Answer: $y = 1/3(x + 2)(x - 3)$ # <b>3</b>	Previous Answer: $y = 1/2(x + 1)(x - 3)$ # <b>6</b>
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7. Write a quadratic equation in intercept form that goes through the point (-2, 4) and has intercepts at (0, 0) and (-4, 0).  
 $4 = a(-2-0)(-2+4)$   
 $4 = a(-2)(2)$   
 $4 = -4a$   
 $\frac{4}{-4} = a$   
 $a = -1$   
 **$y = -x(x+4)$**

8. Write a quadratic equation in intercept form that goes through the point (4, -4) and has intercepts at (2, 0) and (6, 0).  
 $-4 = a(4-2)(4-6)$   
 $-4 = a(2)(-2)$   
 $-4 = a(2)(-2)$   
 $-4 = -4a$   
 $\frac{-4}{-4} = a$   
 $a = 1$   
 **$y = (x-2)(x-6)$**

Previous Answer: $y = -x(x + 4)$ # <b>7</b>	Previous Answer: $y = x(x - 5)$ # <b>4</b>
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9. Write a quadratic equation in intercept form that goes through the point (0, -4) and has intercepts at (2, 0) and (-2, 0).  
 $-4 = a(0-2)(0+2)$   
 $-4 = a(-2)(2)$   
 $-4 = -4a$   
 $\frac{-4}{-4} = a$   
 $a = 1$   
 **$y = (x-2)(x+2)$**

10. Write a quadratic equation in intercept form that goes through the point (1, -6) and has intercepts at (-3, 0) and (2, 0).  
 $-6 = a(1+3)(1-2)$   
 $-6 = a(4)(-1)$   
 $-6 = a(4)(-1)$   
 $-6 = -4a$   
 $\frac{-6}{-4} = a$   
 $\frac{3}{2} = a$   
 **$y = \frac{3}{2}(x+3)(x-2)$**



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check it out!

The image shows a collage of algebra worksheets and a digital tablet. The worksheets include:

- Answer Key** for **ADDING & SUBTRACTING RATIONAL EXPRESSIONS** and **SOLVING SYSTEMS OF EQUATIONS**.
- MULTIPLYING & DIVIDING RATIONAL EXPRESSIONS** worksheet with problems like  $\frac{x-2}{x^2+2x+1}$ .
- SOLVING SYSTEMS OF EQUATIONS** worksheet with problems like  $2. 2x - 6y = -18$  and  $x = 3y - 4$ .

The digital tablet displays a self-checking activity titled **Rational Expression Operations - Addition & Subtraction**. The directions are: "Answer each question and type the question number with the matching answer in the answer column to the right." The activity consists of a table with 8 questions and 8 answers, with a path of colored lines connecting the questions to their corresponding answers.

#	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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