

keep scrolling to get
a sneak peek!

Help your Algebra 2 students practice **writing equations of parent function transformations** from graphs and a set of transformations. Students will be eager to get the self-checking benefits from this circuit activity!

WRITING EQUATIONS OF FUNCTION TRANSFORMATIONS

Differentiated Circuit worksheet

by _____ Date: _____

QUATIONS OF FUNCTION TRANSFORMATIONS

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.

3 → 6 → 8 → 2 → 7 → 5 → 10 → 4 →

$f(x) = 2(x - 5)^3$	# 5	Previous Answer: $f(x) = \frac{1}{2}\sqrt{x + 4}$
on for an absolute value function stretched left		2. Write an equation for the function graphed below.
$- x + 4$		$f(x) = (x + 2)^2 - 3$
Previous Answer: $f(x) = 2(x - 5)^3$	# 9	Previous Answer: $f(x) = -2(x + 1)^3$
function stretched left		4. Write an equation for a cubic function stretched vertically by a scale factor of 3.
		Previous Answer: $f(x) = - x - 6$
		3. Write an equation for a cubic function that is reflected over the y-axis and vertically stretched by 3.
		Previous Answer: $f(x) = \sqrt[3]{-2x + 1}$
		1. Write an equation for the function graphed below.
		Previous Answer: $f(x) = -2(x - 1)^2 + 3$
		2. Write an equation for a function that is stretched horizontally by a factor of 2 and shifted 3 units right.
		Previous Answer: $f(x) = -2(x - 1)^2 + 3$
		4. Write an equation for a function that is stretched horizontally by a factor of 2 and shifted 3 units right.



2 versions + answer key included

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Why do you need this?

Writing Equations of Parent Function Transformations Circuit



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



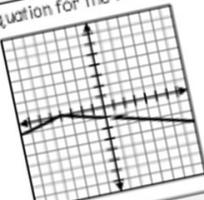
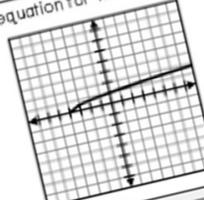
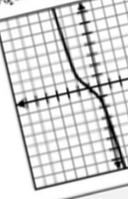
2 differentiated versions for all students practice this essential math skill.

Name: _____ Date: _____

WRITING EQUATIONS OF FUNCTION TRANSFORMATIONS

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: $f(x) = \sqrt[3]{-2x+1}$ # _____	Previous Answer: _____
1. Write an equation for the function graphed below. 	2. Write an equation for a function that is a reflection of $f(x) = x^2$ across the y-axis and shifted 2 units down.
Previous Answer: $f(x) = - x - 6$ # _____	Previous Answer: _____
3. Write an equation for a cubic function that is reflected over the y-axis and vertically stretched by 3.	4. Write an equation for a function that is a reflection of $f(x) = x^2$ across the y-axis and shifted 2 units down.
Previous Answer: $f(x) = \frac{3}{2}(x-1)^2$ # _____	Previous Answer: _____
5. Write an equation for a quadratic function that is reflected over the x-axis and shifted left 2 units.	6. Write an equation for a function that is a reflection of $f(x) = x^2$ across the y-axis and shifted 2 units down.
Previous Answer: $f(x) = (x+2)^2 - 3$ # _____	Previous Answer: _____
7. Write an equation for a quadratic function that reflects over the x-axis and shifts right 3 units.	8. Write an equation for the function graphed below. 
Previous Answer: $f(x) = - x + 4$ # _____	Previous Answer: $f(x) = \sqrt[3]{x-4} + 2$
9. Write an equation for a cube root function that is vertically compressed by $1/4$ and shifted left 2 units.	10. Write an equation for the function graphed below. 

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

Absolute Value: $f(x) = |x|$
Quadratic: $f(x) = x^2$
Square Root: $f(x) = \sqrt{x}$

Reflections:
• Over the x-axis: $-f(x)$
• Over the y-axis: $f(-x)$

Translations:
• Right h units: $(x+h)$
• Left h units: $(x-h)$
• Up k units: $f(x)+k$
• Down k units: $f(x)-k$

Dilations:
• Vertical stretch: $af(x)$
• Vertical compression: $f(ax)$

Writing Equations of Transformations *includes:*

Challenge: You're given the function $f(x) = -\sqrt[3]{x+2} + 4$. Apply the transformations below to create a new transformed function, $g(x)$.

- Reflect over the y-axis
- Shift the entire function right 1 unit

How are you feeling about this topic? Circle one:

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

Absolute Value: $f(x) = x $	Reflections: <ul style="list-style-type: none">• Over the x-axis: $-f(x)$• Over the y-axis: $f(-x)$
Quadratic: $f(x) = x^2$	Translations: <ul style="list-style-type: none">• Right h units: $(x - h)$• Left h units: $(x + h)$• Up k units: $f(x) + k$• Down k units: $f(x) - k$
Square Root: $f(x) = \sqrt{x}$	Dilations: <ul style="list-style-type: none">• Vertical stretch: $af(x)$ when $a > 1$• Vertical compression: $af(x)$ when $0 < a < 1$• Horizontal stretch: $f(bx)$ when $0 < b < 1$• Horizontal compression: $f(bx)$ when $b > 1$
Cubic: $f(x) = x^3$	
Cube Root: $f(x) = \sqrt[3]{x}$	

How are you feeling about this topic? Circle one:

✓ 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

Writing Equations of Transformations

standards covered:

CCSS: HSF-BF.B.3

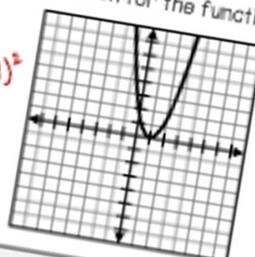
TEKs: A2.2.A

VA SOLs: F.All.6.ab

WRITING EQUATIONS OF FUNCTION TRANSFORMATIONS

Previous Answer: $f(x) = \sqrt{\frac{1}{2}(x-3)}$ # **2**

7. Write an equation for the function graphed below.



$f(x) = \frac{3}{2}(x-1)^2$

Previous Answer: $f(x) = \frac{3}{2}\sqrt{-x+6}$ # **6**

8. Write an equation of a cube root function that is horizontally compressed by a scale factor of $\frac{1}{3}$ and shifted 1 unit up.

$f(x) = \sqrt[3]{3x} + 1$

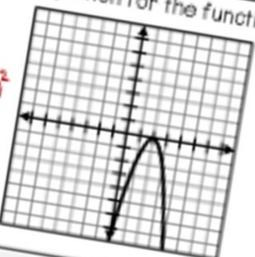
Previous Answer: $f(x) = -\frac{1}{4}|x+4|$ # **1**

9. Write an equation of an absolute value function that is reflected over the x-axis and shifted 6 units down.

$f(x) = -|x| - 6$

Previous Answer: $f(x) = -(x+2)^2$ # **5**

10. Write an equation for the function graphed below.



$f(x) = -2(x-2)^2$

Challenge: You're given the function $f(x) = -\sqrt[3]{x+2} + 4$. Apply the transformations below to create a new transformed function, $g(x)$.

- Reflect over the y-axis
- Shift the entire function right 1 unit

$g(x) = -\sqrt[3]{-x+2} + 4$

$g(x) = -\sqrt[3]{-x+2} + 4$

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.

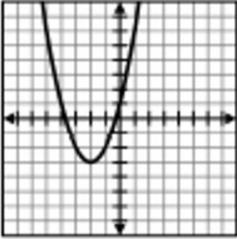


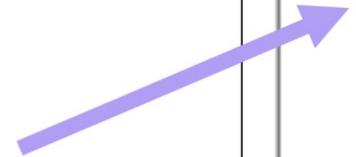
Name: _____ Date: _____

WRITING EQUATIONS OF FUNCTION TRANSFORMATIONS

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: $f(x) = 2(x - 5)^3$ # _____	Previous Answer: $f(x) = \frac{1}{2}\sqrt{x + 4}$ # _____
1. Write an equation for an absolute value function that reflects over the x-axis and shifts up 4 units.	2. Write an equation for the function graphed below. 
Previous Answer: $f(x) = \frac{1}{4}\sqrt[3]{x + 2}$ # _____	Previous Answer: $f(x) = -2(x + 1)^3$ # _____
3. Write an equation for a square root function that is reflected over the y-axis and shifted left 1 unit.	4. Write an equation for a cubic function that is vertically stretched by a scale factor of 2 and shifts right 5 units.



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: _____

WRITING EQUATIONS OF FUNCTION TRANSFORMATIONS

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

Previous Answer: $f(x) = 2(x - 5)^3$ # 5	Previous Answer: $f(x) = \frac{1}{2}\sqrt{x+4}$ # 8
1. Write an equation for an absolute value function that reflects over the y-axis and shifts up 4 units. $f(x) = - x + 4$	2. Write an equation for the function graphed below.
Previous Answer: $f(x) = \frac{1}{4}\sqrt[3]{x}$	7. Write an equation for the function graphed below. $f(x) = \frac{3}{2}(x-1)^2$
3. Write an equation for a square root function that is reflected over the y-axis and shifted 1 unit down. $f(x) = \sqrt{-x-1}$	8. Write an equation of a cube root function that is horizontally compressed by a scale factor of 1/3 and shifted 1 unit up. $f(x) = \sqrt[3]{3x} + 1$
Previous Answer: $f(x) = -\frac{1}{4} x+4 $ # 1	Previous Answer: $f(x) = \frac{3}{2}\sqrt{-x+6}$ # 6
9. Write an equation of an absolute value function that is reflected over the x-axis and shifted 6 units down. $f(x) = - x - 6$	10. Write an equation for the function graphed below. $f(x) = -2(x-2)^2$
5. Write an equation for the function graphed below. $f(x) = \sqrt[3]{x-4} + 1$	Challenge: You're given the function $f(x) = -\frac{3}{2}\sqrt{x+2} + 11$. Apply the transformations below to create

This is a great activity to use when reviewing how to write equations of transformations of parent functions.

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

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

You may also enjoy...

TRANSFORMATIONS OF PARENT FUNCTIONS

Writing Equations Worksheets

Directions: Given each function and transformation, write the equation of the parent function and describe the transformations.

Write a function $g(x)$ whose graph is a vertical compression by a factor of 0.25 followed by a vertical shift up 3 units of the graph of $f(x) = x^2$.
Rule: $g(x) =$ _____

Write a function $g(x)$ whose graph is a vertical shift down by 8 units followed by a vertical compression of $1/2$ of the graph of $f(x) = x^2$.
Rule: $g(x) =$ _____

Write a function $g(x)$ whose graph is a horizontal shift right 3 units followed by a vertical stretch of 3 of the graph of $f(x) = \frac{1}{3}x + 3$.
Rule: $g(x) =$ _____

Answer key included

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FUNCTION TRANSFORMATIONS

Algebra 2 Guided Notes

Types of Transformation

Type of Transformation	Coordinate Translation
Vertical Translation	$(x, y) \rightarrow (x, y + k)$
Horizontal Translation	$(x, y) \rightarrow (x + h, y)$
Vertical Dilation	$(x, y) \rightarrow (x, ky)$
Horizontal Dilation	$(x, y) \rightarrow (kx, y)$
Reflection over the x-axis	$(x, y) \rightarrow (x, -y)$
Reflection over the y-axis	$(x, y) \rightarrow (-x, y)$

Directions: Complete the transformation table and use the information to graph the function $f(x) = |x| + 3$.

Directions: State the parent function and describe the transformations.

Answer key included

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IDENTIFY TRANSFORMATIONS OF PARENT FUNCTIONS FROM GRAPHS & EQUATIONS

Differentiated Circuit Worksheet

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 to your question. Continue until you have completed the questions and you are back to the original question. Record your path below.

1 → _____ → _____ → _____ → _____ → _____

2 → 9 → 3 → 8 → 4 → 10 → 5 → 7 → _____

down 5 units

Previous Answer: horizontal compression by a scale factor of 2.

2. Identify the transformation of the function:

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

Previous Answer: reflection over the y-axis, 5 units up

1. Identify the transformation of the function:

$f(x) = \frac{1}{2}(x - 2)^2$

2. Identify the transformation of the function:

$f(x) = -2|x|$

Previous Answer: 3 units right

Previous Answer: 5 units to the left, horizontal stretch by a scale factor of 4

3. Identify the transformation of the function:

Previous Answer: 4 units right by a scale of 3, reflection over the x-axis

4. Identify the transformation of the function:

2 versions + Answer key included

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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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