

keep scrolling to  
get a sneak peek!

# FUNCTIONS UNIT

## Halloween Review Stations

Help your Algebra 2 students review **interpreting function skills** with these Halloween review stations! Students will be eager to get the self-checking review benefits from these activities!

The collage shows four distinct math review stations:

- Station 1:** A grid with a mystery image. It includes functions  $f(x) = -(x-2)^2$  and  $g(x) = \frac{1}{2}\sqrt[3]{x-4}$ , and a graph of  $h(x) = -2^x$ . It lists parent function letters (B, D, H, C) and transformation colors (Orange, Yellow, Purple, Orange).
- Station 2:** A coordinate plane with a piecewise function:  $f(x) = \begin{cases} x+2, & x < 0 \\ x^2, & x \geq 0 \end{cases}$ . It includes a graph and a table for parent functions: A) Linear, B) Quadratic.
- Station 3:** A coordinate plane with a piecewise function:  $h(x) = \begin{cases} x^2 - 4, & x < 2 \\ 5x - 3, & x \geq 2 \end{cases}$ . It includes a graph and a table for parent functions: A) Linear, B) Quadratic.
- Station 4:** A coordinate plane with a piecewise function:  $f(x) = \begin{cases} -2x - 1, & x < -1 \\ 3, & -1 \leq x \leq 2 \\ x - 4, & x > 2 \end{cases}$ . It includes a graph and a table for parent functions: A) Linear, B) Quadratic.

Additional activities shown include a grid-in answer key for a composition problem: "If  $f(x) = 2x$  and  $g(x) = x^2 + 4$ , find  $(f \circ g)(-1)$ ." and another problem: "Given the graph find  $(f \circ g)(-1)$ ." with a graph showing two intersecting lines  $f(x)$  and  $g(x)$ . A third problem asks: "If  $f(x) = 2x + 1$  and  $g(x) = x^2 + 4$ , find  $(f \circ g)(x)$ ." with a ghost icon.



4 Stations activities + Answer keys

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# Why do you need this?

There are a variety of activities that cover several topics.



Help your students practice these essential math skills.



The activities have self-checking components so students can receive feedback!



# Function Review Stations

The collage features several station cards:

- Station 1: Transformations of Parent Functions Review**
  - Directions: Match the graphs and equations with their corresponding parent function and set of transformations. Color parent function & set of transformations.
  - Parent Functions: A) Linear, B) Quadratic, C) Exponential, D) Cube Root, E) Absolute Value, F) Cubic, G) Logarithmic, H) Square Root.
  - Transformation(s): Blue: Vertical stretch by 2, Left 2; Orange: Reflection over the x-axis, Right 2; Purple: Reflection over the y-axis, Up 3; Red: Horizontal stretch by 2, Down 1; Black: Left 3, Down 1; Yellow: Vertical compression by 1/2, Right 4; Green: Reflection over the x-axis, Down 1.
- Station 4: Piecewise Functions**
  - Directions: Evaluate each piecewise function.
  - 1.  $f(x) = \begin{cases} x+2, & x < 0 \\ x^2, & x \geq 0 \end{cases}$
  - 2.  $f(x) = \begin{cases} -2x-1, & x < -1 \\ 3, & -1 \leq x \leq 2 \\ x-4, & x > 2 \end{cases}$
  - 3. Given  $h(x)$  below, find  $f(-1)$ .
  - 4. Given  $p(x)$  below, find  $p(-3)$  and  $p(3)$ .
- Station 1: Transformations of Parent Functions Review (ANSWER KEY)**
  - 1.  $f(x) = -(x-2)^2$
  - 2.  $g(x) = \frac{1}{2}\sqrt{x-4}$
  - 3.  $h(x) = \begin{cases} x+2, & x < 0 \\ x^2, & x \geq 0 \end{cases}$
  - 4.  $p(x) = \begin{cases} -2x-1, & x < -1 \\ 3, & -1 \leq x \leq 2 \\ x-4, & x > 2 \end{cases}$
- Station 4: Piecewise Functions (ANSWER KEY)**
  - 1.  $h(-1) = (-1)^2 - 4 = 1 - 4 = -3$
  - 2.  $h(3) = 5(3) - 5 = 15 - 5 = 10$
  - 3.  $h(3) = 15 - 5 = 10$
  - 4.  $h(3) = 12$
  - 5.  $p(-3) = -1$ ,  $p(3) = 0$
  - 6.  $g(x) = \begin{cases} x^2, & x \leq 1 \\ -x+3, & x > 1 \end{cases}$
- Station 1: Transformations of Parent Functions Review (Crossword)**
  - Directions: Match the graphs and equations with their corresponding parent function and set of transformations. Color parent function & set of transformations. Each parent function & set of transformations will help you where another to color the grid to reveal a mystery image.
  - Parent Functions: A) Linear, B) Quadratic, C) Exponential, D) Cube Root, E) Absolute Value, F) Cubic, G) Logarithmic, H) Square Root.
  - Transformation(s): Blue: Vertical stretch by 2, Left 2; Orange: Reflection over the x-axis, Right 2; Purple: Reflection over the y-axis, Up 3; Red: Horizontal stretch by 2, Down 1; Black: Left 3, Down 1; Yellow: Vertical compression by 1/2, Right 4; Green: Reflection over the x-axis, Down 1.

# Functions Halloween Review Stations *includes:*

**T**  
If  $f(x) = x^2 - 9$  and  $g(x) = x - 3$ , find  $(\frac{f}{g})(x)$ .



**k**  
If  $f(x) = 2x^4 - 8x^2 - 16x$  and  $g(x) = -2x$ , find  $(\frac{f}{g})(x)$ .



**O**  
If  $f(x) = 2x$  and  $g(x) = x$ , find  $(f \circ g)(x)$ .



**STATION 3: FINDING INVERSE FUNCTIONS**  
Directions: Identify the inverse of each function and find the answer and corresponding letter in the answer bank. Write the letter in the blank, and when you are finished, the letters will spell the answer to a mystery word.

1. Find & verify the inverse of $f(x) = 2x + 1$	2. Find & verify the inverse of $f(x) = \sqrt{x-4}$	3. Find & verify the inverse of $f(x) = \frac{1}{x}$
4. Find & verify the inverse of $f(x) = \frac{2x+6}{3}$	5. Find & verify the inverse of $f(x) = (x-4)^2$	

N	R	B
$f^{-1}(x) = 2x + 12$	$f^{-1}(x) = \frac{x+1}{2}$	$f^{-1}(x) = (x+4)^2$
A	O	G
$f^{-1}(x) = \sqrt{x+4}$	$f^{-1}(x) = \frac{3}{2}x - 3$	$f^{-1}(x) = x^2 + 4$

**STATION 2: OPERATIONS & COMPOSITION OF FUNCTIONS REVIEW**  
Directions: Use the space below to show your work to answer each task card. Once all the task cards are answered, you will unscramble the letters to spell the mystery word at the bottom.


Hint: "I light the night with a spooky grin."

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 4 printable station activities

 detailed answer keys

# station 1

## Skill: Transformations of Parent Functions (*identifying transformations from graphs & equations*)

Students will identify the parent function and transformations of a given graph or equation. Then they will find the letter and color corresponding to their answer choices and color in the grid to reveal a Halloween image.

### Includes:

- 6 questions
- Worksheet with blank grid
- Answer key

Name: \_\_\_\_\_ Date: \_\_\_\_\_

**STATION 1: TRANSFORMATIONS OF PARENT FUNCTIONS REVIEW**

Directions: Match the graphs and equations with their corresponding parent function and set of transformations. Each parent function & set of transformations will tell you where and how to color the grid to reveal a mystery image.

	$f(x) = -(x - 2)^2$	$g(x) = \frac{1}{2}\sqrt[3]{x - 4}$		$h(x) = -2^x - 2$	
Parent Function Letter: _____	Parent Function Letter: _____	Parent Function Letter: _____	Parent Function Letter: _____	Parent Function Letter: _____	Parent Function Letter: _____
Transformation(s) Color: _____	Transformation(s) Color: _____	Transformation(s) Color: _____	Transformation(s) Color: _____	Transformation(s) Color: _____	Transformation(s) Color: _____

Blank grid for coloring

Name: \_\_\_\_\_ Date: \_\_\_\_\_

**ANSWER KEY**

**STATION 1: TRANSFORMATIONS OF PARENT FUNCTIONS REVIEW**

Directions: Match the graphs and equations with their corresponding parent function and set of transformations. Each parent function & set of transformations will tell you where and how to color the grid to reveal a mystery image.

	$f(x) = -(x - 2)^2$	$g(x) = \frac{1}{2}\sqrt[3]{x - 4}$		$h(x) = -2^x - 2$	
Parent Function Letter: <b>E</b>	Parent Function Letter: <b>B</b>	Parent Function Letter: <b>D</b>	Parent Function Letter: <b>H</b>	Parent Function Letter: <b>C</b>	Parent Function Letter: <b>F</b>
Transformation(s) Color: <b>Black</b>	Transformation(s) Color: <b>Orange</b>	Transformation(s) Color: <b>Yellow</b>	Transformation(s) Color: <b>Purple</b>	Transformation(s) Color: <b>Orange</b>	Transformation(s) Color: <b>Black</b>

Parent Functions:

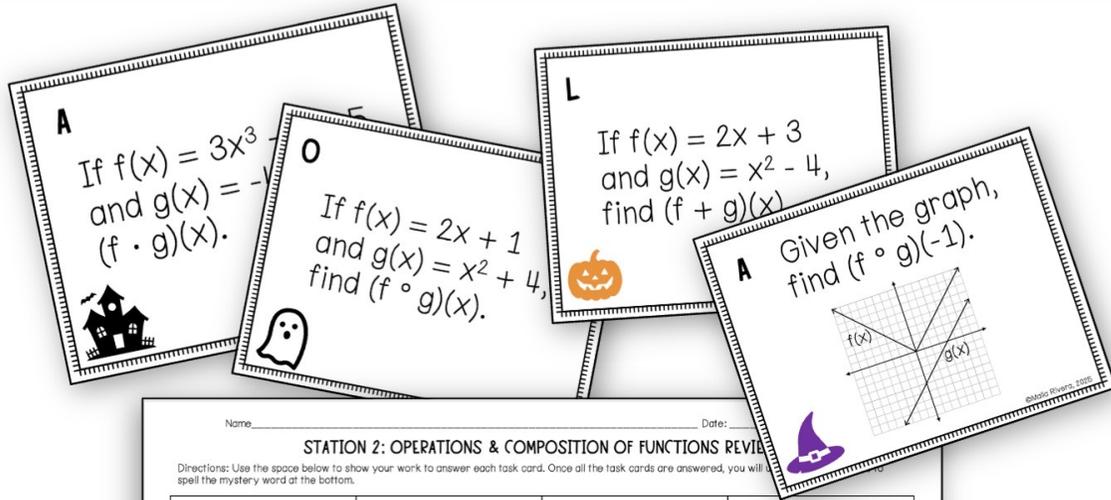
- A) Linear
- B) Quadratic
- C) Exponential
- D) Cube Root
- E) Absolute Value
- F) Cubic
- G) Logarithmic
- H) Square Root

Transformation(s):

- Blue: Vertical stretch by 2, Left 2
- Orange: Reflection over the x-axis, Right 2
- Purple: Reflection over the y-axis, Up 3
- Red: Horizontal stretch by 2, Down 1
- Black: Left 3, Down 1
- Yellow: Vertical compression by 1/2, Right 4
- Green: Reflection over the x-axis, Down 1

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# station 2



Name: \_\_\_\_\_ Date: \_\_\_\_\_

**STATION 2: OPERATIONS & COMPOSITION OF FUNCTIONS REVIEW**

Directions: Use the space below to show your work to answer each task card. Once all the task cards are answered, you will spell the mystery word at the bottom.


Hint: "I light the night with a spooky grin."

\_\_\_\_\_

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## Skill: Operations & Composition of Functions

Students will answer each task card. They can show their work on the recording sheet. Each task card has a letter on the card. Then they will record the letters as they complete each task card. Given the hint, students will unscramble the letters to reveal a secret word.

### Includes:

- 12 questions
- Recording sheet
- Detailed answer key



# station 4

Name: \_\_\_\_\_ Date: \_\_\_\_\_

**ANSWER KEY**

**STATION 4: PIECEWISE FUNCTIONS**

Directions: Graph each piecewise function.

1.  $f(x) = \begin{cases} x + 2, & x < 0 \\ x^2, & x \geq 0 \end{cases}$

Directions: Evaluate each piecewise function.

3. Given  $h(x)$  below, find  $h(-1)$  and  $h(3)$ .

$$h(x) = \begin{cases} x^2 - 4, & x < 2 \\ 5x - 3, & x \geq 2 \end{cases}$$

$h(-1) = (-1)^2 - 4$   
 $h(-1) = 1 - 4$   
 $h(-1) = -3$

$h(3) = 5(3) - 3$   
 $h(3) = 15 - 3$   
 $h(3) = 12$

Directions: Write the piecewise function of each graph.

5.

$f(x) = \begin{cases} x + 2, & x < 0 \\ 4, & x \geq 0 \end{cases}$

Domain:  $(-\infty, 0) \cup [0, \infty)$  Range:  $(-\infty, 2) \cup [4, \infty)$

Directions: Graph each piecewise function.

2.  $f(x) = \begin{cases} -2x - 1, & x < -1 \\ 3, & -1 \leq x \leq 2 \\ x - 4, & x > 2 \end{cases}$

Directions: Evaluate each piecewise function.

4. Given  $p(x)$  below, find  $p(-3)$ .

$p(-3) = -$

**STATION 4: PIECEWISE FUNCTIONS**

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Directions: Graph each piecewise function.

1.  $f(x) = \begin{cases} x + 2, & x < 0 \\ x^2, & x \geq 0 \end{cases}$

Directions: Evaluate each piecewise function.

3. Given  $h(x)$  below, find  $h(-1)$  and  $h(3)$ .

$$h(x) = \begin{cases} x^2 - 4, & x < 2 \\ 5x - 3, & x \geq 2 \end{cases}$$

Directions: Write the piecewise function of each graph.

5.

Domain: \_\_\_\_\_ Range: \_\_\_\_\_

Directions: Graph each piecewise function.

2.  $f(x) = \begin{cases} -2x - 1, & x < -1 \\ 3, & -1 \leq x \leq 2 \\ x - 4, & x > 2 \end{cases}$

Directions: Evaluate each piecewise function.

4. Given  $p(x)$  below, find  $p(-3)$  &  $p(3)$ .

Domain: \_\_\_\_\_ Range: \_\_\_\_\_

6.

Domain: \_\_\_\_\_ Range: \_\_\_\_\_

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## Skill: Piecewise Functions

Students will graph piecewise functions with two and 3 functions. Given a piecewise function equation set and graph of a piecewise function, students will evaluate at a certain point. Students will also write the piecewise function given a graph.

### Includes:

- 6 questions
- Detailed answer key

# Functions Review Stations

standards covered:

**CCSS:** HSF-IF.B.4, HSF-IF.C.7b, HSF-BF.A.1bc, HSF-BF.B.4, HSF-BF.B.4b

**TEKs:** A2.2.B, A2.2.D, A2.4.C, A2.5.A, A2.6AC, P.2.ABF

**VA SOLs:** All.6.b, All.7.akj

Name: \_\_\_\_\_ Date: \_\_\_\_\_

**ANSWER KEY**

**STATION 3: FINDING INVERSE FUNCTIONS**

Directions: Identify the inverse of each function and find the answer and corresponding letter in the answer bank. Write the letter in the blank, and when you are finished, the letters will spell the answer to a mystery word.

1. Find & verify the inverse of $f(x) = 2x + 1$ $x = 2y + 1$ $-1$ $x - 1 = 2y$ $\frac{x-1}{2}$ $f^{-1}(x) = \frac{x-1}{2}$ (L)	2. Find & verify the inverse of $f(x) = \sqrt{x-4}$ $(x)^2 = (\sqrt{y-4})^2$ $x^2 = y - 4$ $+4$ $f^{-1}(x) = x^2 + 4$ (G)	3. Find & verify the inverse of $f(x) = \frac{1}{2}x - 6$ $x = \frac{1}{2}y - 6$ $+6$ $2(x+6) = (\frac{1}{2}y)2$ $f^{-1}(x) = 2x + 12$ (N)
4. Find & verify the inverse of $f(x) = \frac{2x+6}{3}$ $x = \frac{2y+6}{3}$ $\cdot 3$ $3x = 2y + 6$ $-6$ $3x - 6 = 2y$ $\frac{3x-6}{2}$ $f^{-1}(x) = \frac{3}{2}x - 3$ (O)	5. Find and verify the inverse of $f(x) = (x-4)^2$ $\sqrt{x} = \sqrt{(y-4)^2}$ $\sqrt{x} = y - 4$ $+4$ $f^{-1}(x) = \sqrt{x} + 4$ (I)	6. Find & verify the inverse of $f(x) = \sqrt{x} - 4$ $x = \sqrt{y} - 4$ $+4$ $(x+4)^2 = (\sqrt{y})^2$ $f^{-1}(x) = (x+4)^2$ (B)

Hint: "In spooky myths & tales, I guard treasures or cause trouble."

**G O B L I N**

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**A** Given the graph, find  $(f \circ g)(-1)$ .

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**L** If  $f(x) = 2x + 3$  and  $g(x) = x^2 - 4$ , find  $(f + g)(x)$ .

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**O** If  $f(x) = 2x + 1$  and  $g(x) = x^2 + 4$ , find  $(f \circ g)(x)$ .

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# how to use this resource

**ANSWER KEY** Name: \_\_\_\_\_ Date: \_\_\_\_\_

**STATION 4: PIECEWISE FUNCTIONS**

Directions: Graph each piecewise function.

1.  $f(x) = \begin{cases} x+2, & x < 0 \\ x^2, & x \geq 0 \end{cases}$

2.  $f(x) = \begin{cases} -2x-1, & x < -1 \\ 3, & -1 \leq x \leq 2 \\ x-4, & x > 2 \end{cases}$

3. Given  $h(x)$  below, find  $h(-1)$  and  $h(3)$ .

$$h(x) = \begin{cases} x^2 - 4, & x < 2 \\ 5x - 3, & x \geq 2 \end{cases}$$

$h(-1) = (-1)^2 - 4$   
 $h(-1) = 1 - 4$   
 $h(-1) = -3$

$h(3) = 5(3) - 3$   
 $h(3) = 15 - 3$   
 $h(3) = 12$

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**ANSWER KEY** Name: \_\_\_\_\_ Date: \_\_\_\_\_

**STATION 2: OPERATIONS & COMPOSITION OF FUNCTIONS REVIEW**

Directions: Use the space below to show your work to answer each task card. Once all the task cards are answered, you will unscramble the letters to spell the mystery word at the bottom.

L $x^2 + 2x - 1$	N $-x^2 - 3x - 6$	C $6x^3 - 5x^2 + x$	A $-12x^4 + 4x^2 - 20x$
T $x + 3$	K $-x^3 + 4x + 8$	O $2x^2 + 9$	J $x^2 - 6x + 6$
P			N C

E R N

---

**ANSWER KEY** Name: \_\_\_\_\_ Date: \_\_\_\_\_

**STATION 1: TRANSFORMATIONS OF PARENT FUNCTIONS REVIEW**

Directions: Match the graphs and equations with their corresponding parent function and set of transformations. Each parent function & set of transformations will tell you where and how to color the grid to reveal a mystery image.

	$f(x) = -(x-2)^2$	$g(x) = \frac{1}{2}\sqrt[3]{x-4}$		$h(x) = -2^x - 2$	
Parent Function Letter: E	Parent Function Letter: B	Parent Function Letter: D	Parent Function Letter: H	Parent Function Letter: C	Parent Function Letter: F
Transformation(s): Color: Black	Transformation(s): Color: Orange	Transformation(s): Color: Yellow	Transformation(s): Color: Purple	Transformation(s): Color: Orange	Transformation(s): Color: Black

Parent Functions:	Transformation(s):
A) Linear	Blue: Vertical stretch by 2, Left 2
B) Quadratic	Orange: Reflection over the x-axis, Right 2
C) Exponential	Purple: Reflection over the y-axis, Up 3
D) Cube Root	Red: Horizontal stretch by 2, Down 1
E) Absolute Value	Black: Left 3, Down 1
F) Cubic	Yellow: Vertical compression by 1/2, Right 4
G) Logarithmic	Green: Reflection over the x-axis, Down 1
H) Square Root	

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This is a great activity to use when reviewing for an end of unit assessment on **functions** with a Halloween twist.

These stations are also a **substitute-friendly** assignment!

You may also enjoy ...

# COMPOSITION OF FUNCTIONS

$f(x) = 3x + 2$   
 $g(x) = 4x - 5$   
 $h(x) = 2x^2 + 5$   
 $j(x) = -x^2 + 2x - 1$

Directions: Compose the given functions. Write your answer in the box using "" to show exponent. Do not use spaces in your answer.

Question	Answer
$f(g(x))$	
$g(f(x))$	
$(g \circ g)(x)$	
$(f \circ f)(x)$	
$f(j(x))$	
$g(h(x))$	
$(h \circ f)(x)$	
$j(g(x))$	
$(h \circ g)(x)$	
$(j \circ f)(x)$	

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Self-Checking

# IDENTIFY TRANSFORMATIONS OF PARENT FUNCTIONS FROM GRAPHS & EQUATIONS

Differentiated circuit worksheet

**IDENTIFYING TRANSFORMATIONS OF PARENT FUNCTIONS**

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 the original question. Continue until you have completed the question. Record your path below.

2 → 9 → 3 → 8 → 4 → 10 → 5 → 7 →

down 5 units # 7

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:

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

Previous Answer: 3 units right the x-axis

2. Identify the transformation of the function:

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

Previous Answer: 8 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 y-axis

4. Identify the transformation of the function:

Previous Answer: down 2 units

4. Identify the transformation of the function:



2 versions + answer key included

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# FUNCTIONS & GRAPHS

Algebra 2 Guided Notes

**TRANSFORMATIONS OF FUNCTION**

$y = a f(bx - c) + d$

Dilations of Absolute Value Functions

Vertical

af(x) when

Vertical

af(x) when

Dilations of Absolute Value Functions

Horizontal

af(x) when

Horizontal

af(x) when

**LINEAR PROGRAMMING**

You are manufacturing stuffed animals to sell at a carnival. It takes 5 minutes to make a tiger and 15 minutes to make a bear. You have only 60 minutes to make the stuffed animals. How many animals should you make to maximize your profit?

a) Identify the decision variables:

b) Objective Function:

c) Constraints:

d) Graph & label your axes.



answer key included

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# Free Algebra Activities!

When you join my email list, I'll send you a free Algebra print & digital self-checking activities. There is an Algebra 1 and Algebra 2 version!

You'll also be getting exclusive freebies and content to help your Algebra students be successful this school year!

check it out!

**Answer Key**  
Name: \_\_\_\_\_ Date: \_\_\_\_\_  
**ADDING & SUBTRACTING RATIONAL EXPRESSIONS**  
Directions: Add or subtract the rational expressions. Show your work.

**Solving Systems of Equations**  
Date: \_\_\_\_\_  
Solve systems 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**  
Solving Systems of Equations  
Date: \_\_\_\_\_  
Solve systems of equations using substitution or elimination. Check your solution.  
2.  $2x - 6y = -18$   
 $x = 3y - 9$   
 $2(3y - 9) - 4y = -18$   
 $6y - 18 - 4y = -18$   
 $-18 = -18$   
infinitely many solutions  
 $y = 2 + 5$   
 $y = 7$   
 $(2, 7)$

**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	$\frac{x^2+2x}{x^2-1} - \frac{x+1}{x-1}$	$\frac{x-2}{4x}$	

(c) Malia Rivera, 2024



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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