

keep scrolling to
get a sneak peek!

Help your Algebra 2 students
practice **identifying graph
characteristics**. Students will
be eager to get the self-
checking benefits from this
circuit activity!

IDENTIFYING GRAPH CHARACTERISTICS

Differentiated Circuit Worksheet

name: **Answer Key**

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 → **5** → **9** → **2** → **7** → **10** → **4** → **3** →

Previous Answer: As $x \rightarrow -\infty$, $f(x) \rightarrow -\infty$
As $x \rightarrow \infty$, $f(x) \rightarrow -\infty$ # **6**

1. On which interval is the function decreasing?
2. On which interval is the function negative?

Previous Answer: (-3, 0)

Previous Answer: As $x \rightarrow -\infty$, $f(x) \rightarrow -\infty$
As $x \rightarrow \infty$, $f(x) \rightarrow -\infty$ # **4**

3. On which interval is the function positive?
4. On which interval is the function increasing?

Previous Answer: (-5, -2)

Previous Answer: As $x \rightarrow -\infty$, $f(x) \rightarrow -\infty$
As $x \rightarrow \infty$, $f(x) \rightarrow -\infty$



2 versions + answer key included

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Why do you need this?



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.

Identifying Graph Characteristics Circuit

Name: _____ Date: _____

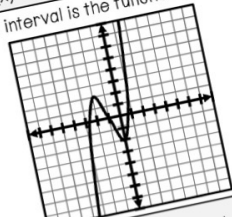
IDENTIFYING CHARACTERISTICS OF GRAPHS CIRCUIT

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: As $x \rightarrow -\infty, f(x) \rightarrow -\infty$ # _____ Previous Answer: _____

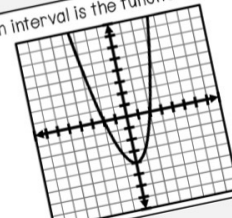
1. On which interval is the function decreasing?



2. On which interval is the function increasing?

Previous Answer: As $x \rightarrow \infty, f(x) \rightarrow -\infty$ # _____ Previous Answer: _____

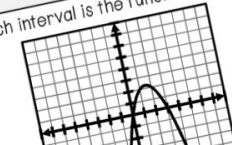
3. On which interval is the function positive?



4. On which interval is the function negative?

Previous Answer: $(-\infty, -1) \cup (1, \infty)$ # _____ Previous Answer: _____

5. On which interval is the function positive?

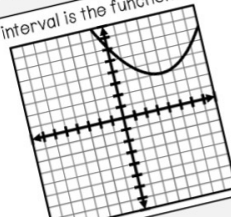


6. What is the end behavior of the function?

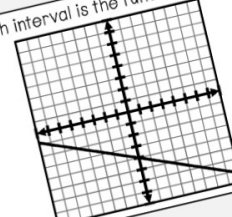
Previous Answer: $(-2, 0)$ # _____ Previous Answer: _____

IDENTIFYING CHARACTERISTICS OF GRAPHS CIRCUIT

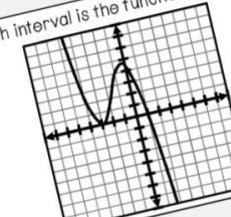
7. On which interval is the function decreasing?



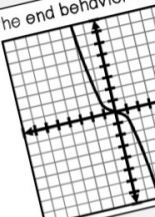
8. On which interval is the function decreasing?



9. On which interval is the function increasing?



10. What is the end behavior of the function?



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

Increasing Intervals: The graph goes UP from left to right.
Decreasing Intervals: The graph goes DOWN from left to right.
Constant: The graph is a horizontal line (aka $f(x) = k$).

End Behavior

As $x \rightarrow -\infty, f(x) \rightarrow \infty$
As $x \rightarrow \infty, f(x) \rightarrow -\infty$

As $x \rightarrow -\infty, f(x) \rightarrow -\infty$
As $x \rightarrow \infty, f(x) \rightarrow \infty$

Where the graph is ABOVE the x-axis.

Characteristics of Graphs includes:

Challenge: Construct a possible continuous function that satisfies all the given characteristics.

- It is increasing on $(-\infty, -1)$ and $(4, \infty)$
- It is decreasing on $(-1, 4)$
- It's end behavior is:
As $x \rightarrow -\infty, f(x) \rightarrow -\infty$
As $x \rightarrow \infty, f(x) \rightarrow \infty$

Where is your function positive? _____

Where is your function negative? _____

How are you feeling about this topic? Circle one:

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

Increasing Intervals: The graph goes UP from left to right.
Decreasing Intervals: The graph goes DOWN from left to right.
Constant: The graph is a horizontal line (aka flat).

Positive Intervals: Where the graph is ABOVE the x-axis.
Negative Intervals: Where the graph is BELOW the x-axis.

End Behavior

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

Identifying Graph Characteristics

standards covered:

CCSS: HSF-BF.4, HSF-IF.C.8

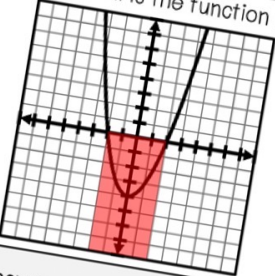
TEKS: A2.2.A

VA SOLs: A.11.7abhi

IDENTIFYING CHARACTERISTICS OF GRAPHS CIRCUIT

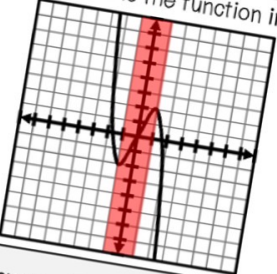
Previous Answer: $(-\infty, -2) \cup (1, 4)$ # **2**

7. On which interval is the function negative?



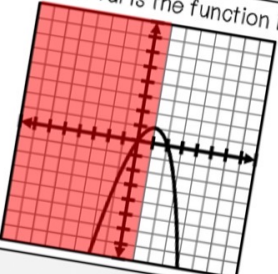
Previous Answer: $(-\infty, -2) \cup (2, \infty)$ # **3**

8. On which interval is the function increasing?



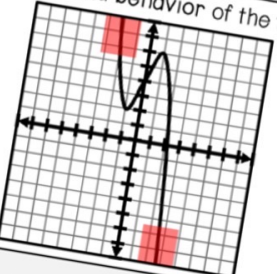
Previous Answer: $(0, 3)$ # **5**

9. On which interval is the function increasing?




Previous Answer: $(-2, 2)$ # **7**

10. What is the end behavior of the function?



Challenge: Construct a possible continuous function that satisfies all the given characteristics.

- It is increasing on $(-\infty, -1)$ and $(4, \infty)$
- It is decreasing on $(-1, 4)$
- It's end behavior is:
As $x \rightarrow -\infty, f(x) \rightarrow -\infty$
As $x \rightarrow \infty, f(x) \rightarrow \infty$



how this circuit resource works

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

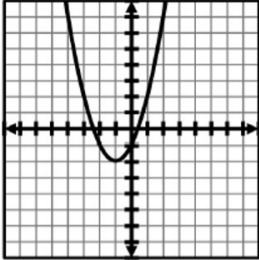
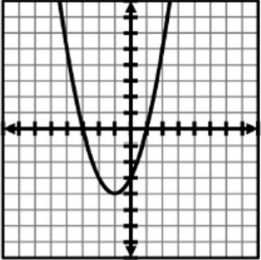
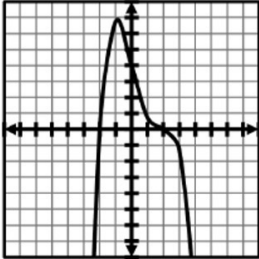
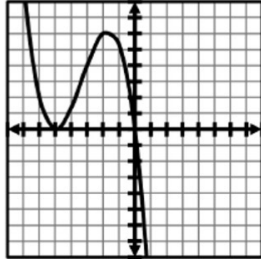
Students can track their path at the top.

Name: _____ Date: _____

IDENTIFYING CHARACTERISTICS OF 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 → _____ → _____ → _____ → _____ → _____ → _____ → _____ → _____ → _____ → 1

Previous Answer: As $x \rightarrow -\infty, f(x) \rightarrow -\infty$ As $x \rightarrow \infty, f(x) \rightarrow -\infty$ # _____	Previous Answer: $(-3, 0)$ # _____
1. On which interval is the function decreasing? 	2. On which interval is the function negative? 
Previous Answer: $(-5, -2)$ # _____	Previous Answer: As $x \rightarrow -\infty, f(x) \rightarrow \infty$ As $x \rightarrow \infty, f(x) \rightarrow -\infty$ # _____
3. On which interval is the function positive? 	4. On which interval is the function increasing? 

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: _____

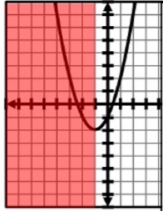
IDENTIFYING CHARACTERISTICS OF GRAPHS CIRCUIT

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

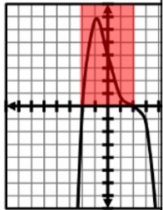
Previous Answer: As $x \rightarrow -\infty, f(x) \rightarrow -\infty$
As $x \rightarrow \infty, f(x) \rightarrow -\infty$ # **6** Previous Answer: $(-3, 0)$ # **9**

1. On which interval is the function decreasing? 2. On which interval is the function negative?



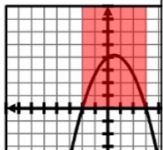
Previous Answer: $(-5, -2)$

3. On which interval is the function increasing?



Previous Answer: $(-\infty, -1)$

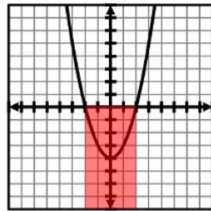
5. On which interval is the function decreasing?



IDENTIFYING CHARACTERISTICS OF GRAPHS CIRCUIT

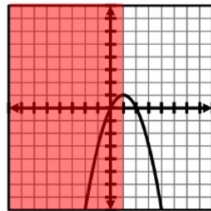
Previous Answer: $(-\infty, -2) \cup (1, 4)$ # **2** Previous Answer: $(-\infty, -2) \cup (2, \infty)$ # **3**

7. On which interval is the function negative?

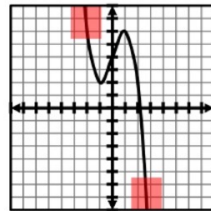


Previous Answer: $(0, 3)$ # **5** Previous Answer: $(-2, 2)$ # **7**

9. On which interval is the function increasing?



10. What is the end behavior of the function?



This is a great activity to use when reviewing identifying intervals of positive, negative, increasing, decreasing, and end behavior from graphs.

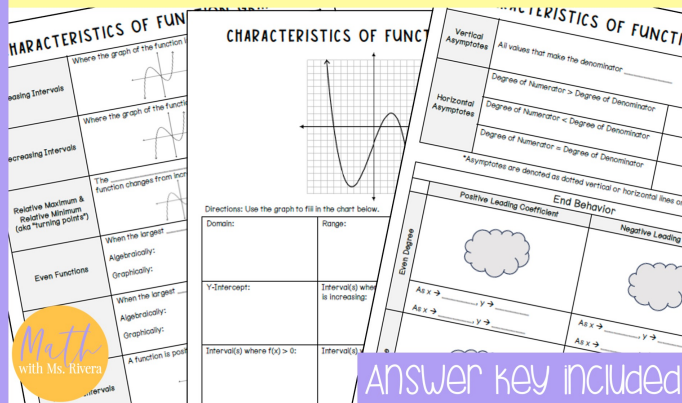
It can be used right after teaching the concept or as homework.

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

You may also enjoy ...

FUNCTION CHARACTERISTICS

Algebra 2 Guided Notes



CHARACTERISTICS OF FUNCTION

Where the graph of the function is increasing/decreasing

Relative Maximum & Relative Minimum (aka "turning points")

Even Functions

CHARACTERISTICS OF FUNCTION

Vertical Asymptotes: All values that make the denominator zero

Horizontal Asymptotes: Degree of Numerator < Degree of Denominator, Degree of Numerator = Degree of Denominator, Degree of Numerator > Degree of Denominator

End Behavior: Positive Leading Coefficient, Negative Leading Coefficient

Directions: Use the graph to fill in the chart below.

Domain: _____ Range: _____

Y-intercept: _____ Interval(s) where the function is increasing: _____

Interval(s) where $f(x) > 0$: _____ Interval(s) where $f(x) < 0$: _____

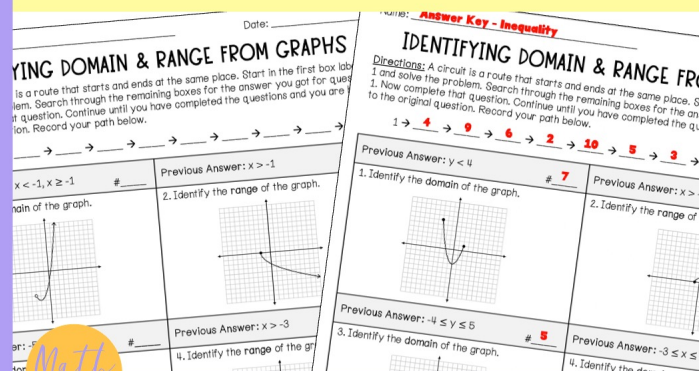
Math with Ms. Rivera

Answer key included

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IDENTIFYING DOMAIN & RANGE FROM GRAPHS

Differentiated Circuit Worksheet



IDENTIFYING DOMAIN & RANGE FROM GRAPHS

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

1 → 4 → 9 → 6 → 2 → 10 → 5 → 3 →

Previous Answer: $x < -1$, $x \geq -1$

2. Identify the range of the graph.

Previous Answer: $x > -1$

1. Identify the domain of the graph.

Previous Answer: $y < 4$

2. Identify the range of the graph.

Previous Answer: $x > -2$

3. Identify the domain of the graph.

Previous Answer: $-4 \leq y \leq 5$

4. Identify the range of the graph.

Previous Answer: $-3 \leq x \leq 2$

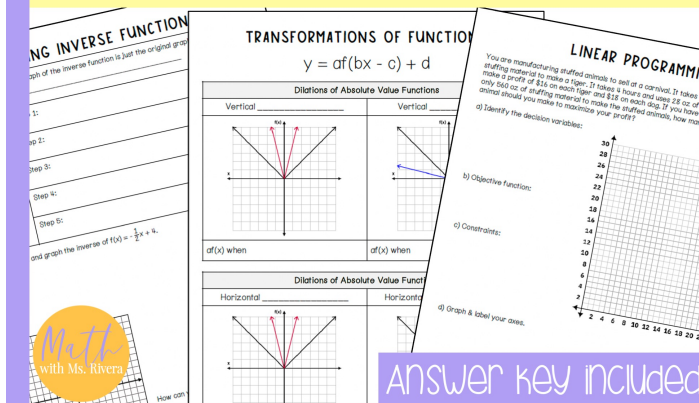
Math with Ms. Rivera

2 versions + Answer key included

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FUNCTIONS & GRAPHS

Algebra 2 Guided Notes



TRANSFORMATIONS OF FUNCTION

$y = a f(b(x - c)) + d$

Dilations of Absolute Value Functions

Vertical: _____ Horizontal: _____

Vertical: _____ Horizontal: _____

Linear Programming

Directions: You are manufacturing stuffed animals to sell at a carnival. It takes 5 minutes to stuff a bear, 3 minutes to stuff a tiger, and 2 minutes to stuff a lion. You have 100 minutes to stuff animals. Each bear costs \$10 to make, each tiger costs \$15, and each lion costs \$20. 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.

Math with Ms. Rivera

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!

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

(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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