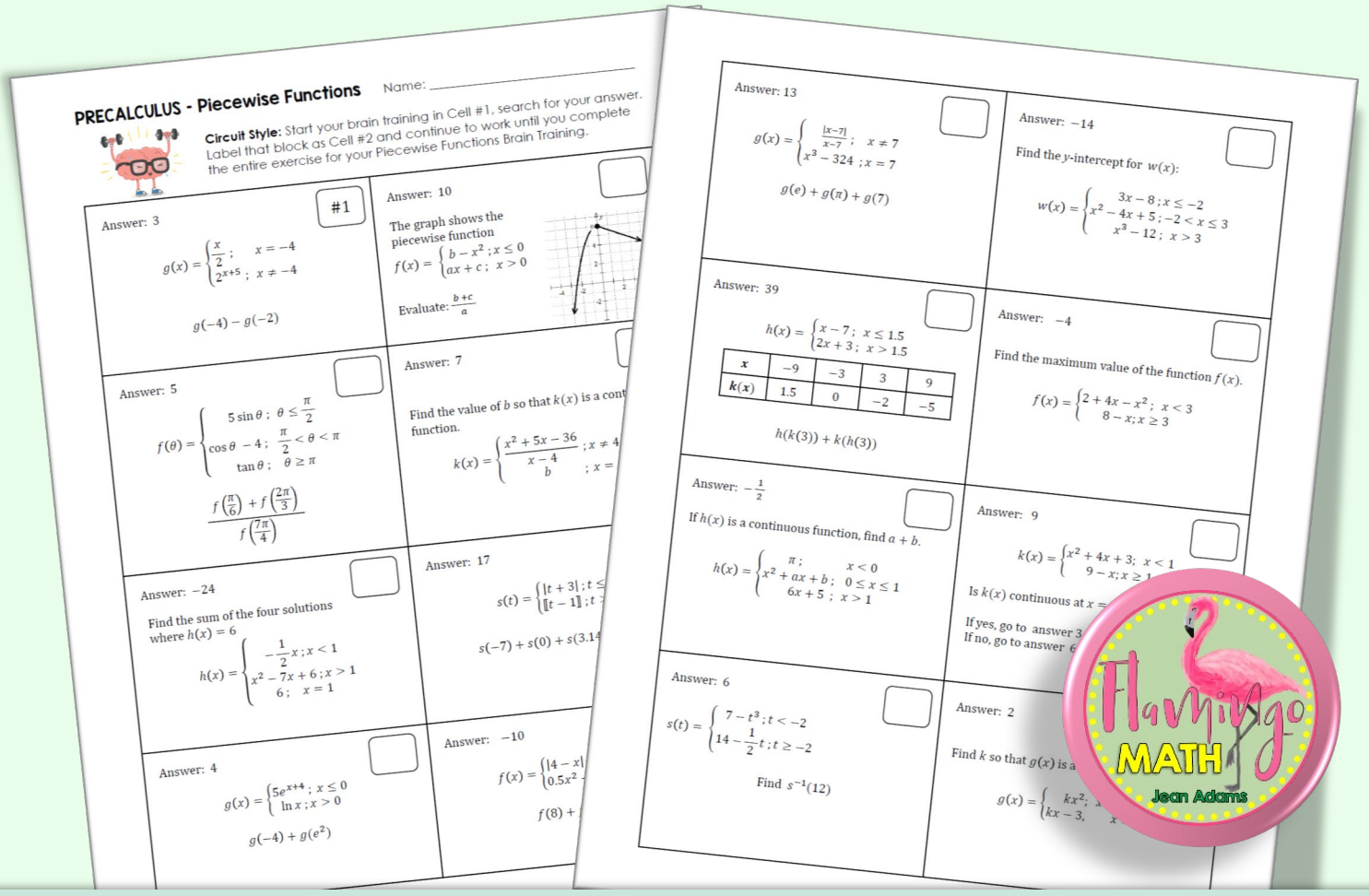
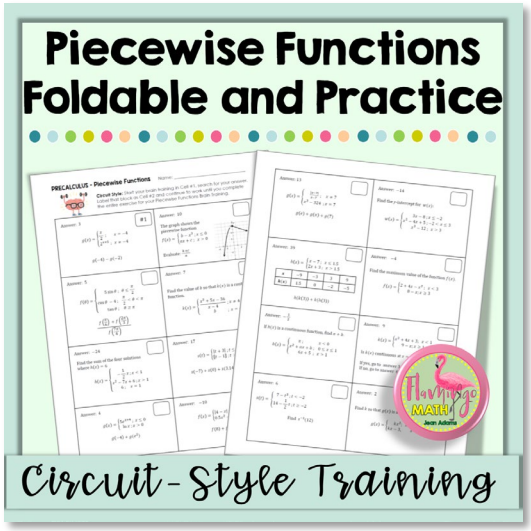
Piecewise Functions Foldable and Practice



Circuit-Style Training

Piecewise Functions Foldable & Circuity



KEY CONCEPTS/TOPICS:

★ Graph piecewise functions
★ Write equations for piecewise functions from a graph
★ Evaluate piecewise functions
★ Convert absolute value functions to piecewise functions
★ Analyze piecewise functions in real-world applications

Product Overview

Piecewise Functions Circuit-Style Training

This resource is designed to help your students gain proficiency in their ability to evaluate piecewise functions in a scavenger-hunt type circuit activity.

This is a self-checking assignment in a "Circuit-style" training. Students start their brain training in Cell #1, then search for the answer. They label that block as Cell #2 and continue to work until they complete the entire exercise for the Brain Training Activity.

There are 16 question stems in the self-checking circuit.

STANDARDS ALIGNMENT:
BEST: MAFS.912.F-IF.3.7.b, MAFS.912.F-IF.1.1, MAFS.912.F-BF.2.3, MAFS.912.F-IF.1.2
CCSS: HSF.IF.A.1; HSF.IF.A.2; HSF.BF.B.3; HSIF.IFC.7.B
TEKS: P.2.C, P.2.D, P.2.F, P.2.G, P.2.I, P.2.J, P.2.K, P.2.L, P.2.M

Preparation

Foldable:
Copy the foldable on a single sheet of paper. Choose double-sided copies and "flip on short side." Fold in half, students can glue in an interactive notebook.

Task Card Sets:
1. Copy a student recording sheet for each group of students.
2. Copy task cards on card stock, cut apart, and laminate for durability.
3. Create sets for groups of 3 – 4 students and store in a plastic bag.

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PRECALCULUS - Piecewise Functions

Name: _____



Circuit Style: Start your brain training in Cell #1, search for your answer. Label that block as Cell #2 and continue to work until you complete the entire exercise for your Piecewise Functions Brain Training.

#1

Answer: 3

$$g(x) = \begin{cases} \frac{x}{2}\ ; & x = -4 \\ 2^{x+5}\ ; & x \neq -4 \end{cases}$$

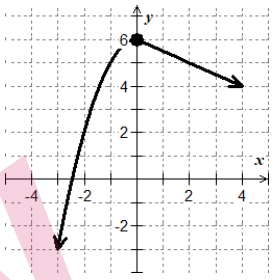
$$g(-4) - g(-2)$$

Answer: 10

The graph shows the piecewise function

$$f(x) = \begin{cases} b - x^2\ ; x \leq 0 \\ ax + c\ ;\ x > 0 \end{cases}$$

Evaluate: $\frac{b+c}{a}$



Answer: 5

$$f(\theta) = \begin{cases} 5\sin\theta\ ;\ \theta \leq \frac{\pi}{2} \\ \cos\theta\ - 4\ ;\ \frac{\pi}{2} < \theta < \pi \\ \tan\theta\ ;\ \theta \geq \pi \end{cases}$$

$$\frac{f\left(\frac{\pi}{6}\right) + f\left(\frac{2\pi}{3}\right)}{f\left(\frac{7\pi}{4}\right)}$$

Answer: 7

Find the value of b so that $k(x)$ is a continuous function.

$$k(x) = \begin{cases} \frac{x^2 + 5x - 36}{x - 4}\ ; x \neq 4 \\ b\ ;\ x = 4 \end{cases}$$

Answer: -24

Find the sum of the four solutions where $h(x) = 6$

$$h(x) = \begin{cases} -\frac{1}{2}x\ ; x < 1 \\ x^2 - 7x + 6\ ; x > 1 \\ 6\ ;\ \ x = 1 \end{cases}$$

Answer: 17

$$s(t) = \begin{cases} |t + 3|\ ; t \leq 1 \\ [\![t - 1]\!]\ ; t > 1 \end{cases}$$

$$s(-7) + s(0) + s(3.14)$$

Answer: 4

$$g(x) = \begin{cases} 5e^{x+4}\ ;\ x \leq 0 \\ \ln x\ ; x > 0 \end{cases}$$

$$g(-4) + g(e^2)$$

Answer: -10

$$f(x) = \begin{cases} |4 - x|\ ; & x \leq 0 \\ 0.5x^2 - 3\ ; & x > 0 \end{cases}$$

$$f(8) + f(-6)$$

PREVIEW

Big Ideas

Lesson: Piecewise Functions

Learning Goals	Mastery Level
Graph piecewise functions	☐ Easy ☐ A few challenges ☐ Very difficult
Evaluate and write equations for piecewise functions	☐ Easy ☐ A few challenges ☐ Very difficult
Convert absolute value functions to piecewise functions	☐ Easy ☐ A few challenges ☐ Very difficult
Analyze piecewise functions in real-world applications	☐ Easy ☐ A few challenges ☐ Very difficult

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Piecewise Functions

Piecewise functions are functions defined by different formulas for different intervals of the ***independent variable.***
Standard notation is given in the following format:

$$f(x)=\begin{cases}\text{formula 1 if (use this domain for formula 1)}\\ \text{formula 2 if (use this domain for formula 2)}\\ \text{formula 3 if (use this domain for formula 3)}\end{cases}$$

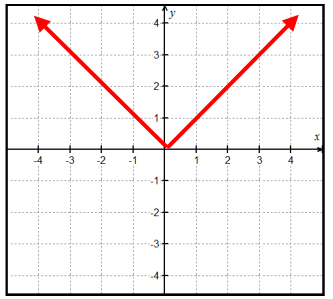
Sub-domains

Examples of Piecewise Functions

EX #1: The Absolute Value Function

Is a piecewise function because

$$|x|=\begin{cases}x, \text{if } x\geq 0\\ -x, \text{if } x<0\end{cases}$$



Is the function above continuous?

yes

State the domain and range.

Domain: $(-\infty,\infty)$ range: $[0,\infty)$

Where is the function increasing? decreasing?

Increasing on: $(0,\infty)$
Decreasing on: $(-\infty,0)$

PREVIEW

Evaluating Piecewise Functions

EX #2: Evaluate. $f(x) = \begin{cases} -2|x+1|, & x < 1 \\ 2, & 1 \le x < 3 \\ 5 - \frac{1}{2}x, & x \ge 3 \end{cases}$

A. $f(12)$

$f(12) = 5 - \frac{1}{2}(12)$

$f(12) = 5 - 6$

$f(12) = -1$

B. $f(2)$

$f(2) = 2$

C. $f(-5)$

$f(-5) = -2|-5+1|$

$f(-5) = -2|-4|$

$f(-5) = -8$

D. $f(0)$

$f(0) = -2|0+1|$

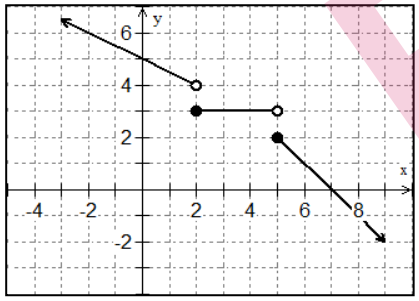
$f(0) = -2|1|$

$f(0) = -2$

Name That Graph

EX #3: Write the piecewise function that represents the graph.

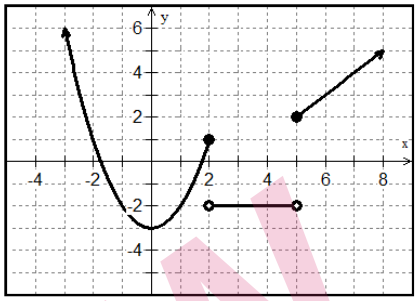
A.



$f(x) = \begin{cases} -\frac{1}{2}x + 5, x < 2 \\ 3, 2 \le x < 5 \\ 7 - x, x \ge 5 \end{cases}$

Name That Graph

B.

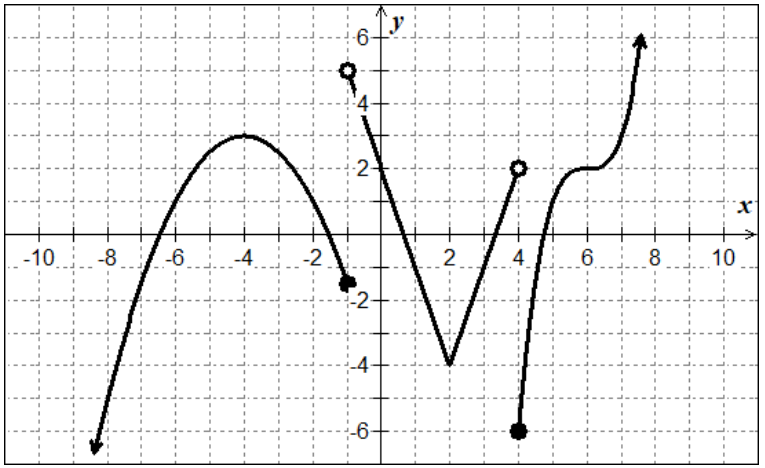


$g(x) = \begin{cases} x^2 - 3, x \le 2 \\ -2, 2 < x < 5 \\ x - 3, x \ge 5 \end{cases}$

Graphing Piecewise Functions

EX #4: Graph the piecewise function.

$f(x) = \begin{cases} -\frac{1}{2}(x+4)^2 + 3, & x \le -1 \\ 3|x-2| - 4 & -1 < x < 4 \\ (x-6)^3 + 2 & x \ge 4 \end{cases}$



PREVIEW