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QUESTION 1



Write the piecewise-defined function for this graph.

Enter your answers in the spaces provided. Use lowercase letters only.

$f(x) = \{$

$x - 1$



if

$x \leq$

-2



x^2



if

-2



$< x <$

4



$\sqrt{x}$

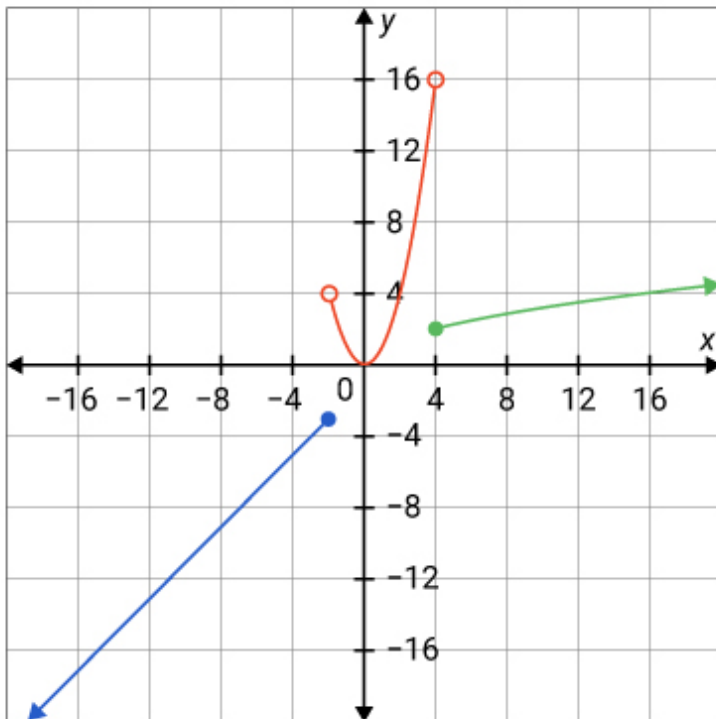


if

$x \geq$

4





QUESTION 2



An electric company charges a fixed amount of AED 200 for a consumption of 0 to 100 kilowatts. An extra AED 2 will be charged for each kilowatt above 100 if the consumption exceeds 100 kilowatts. Write the function which describes the charge for x kilowatts of electricity.

Select the correct answer from the drop-down menu.

$$f(x) = \begin{cases} 200 & \text{if } 0 \leq x \leq 100 \\ 200 + 2(x - 100) & \text{if } x > 100 \end{cases}$$

✓ ▼

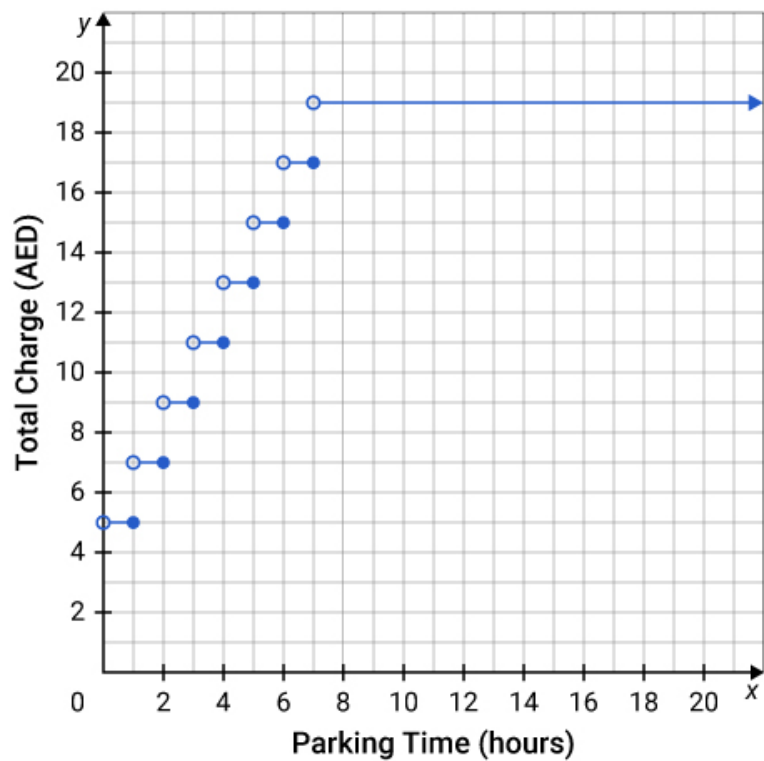
QUESTION 3



The graph shows the total charge in AED for parking in a garage for x hours.

Enter your answers in the spaces provided.

The total charge for parking in the garage for 5.5 hours is AED



15



The total charge for parking in the garage for 4 hours is AED

11



QUESTION 4



Jamaal is a golf instructor that charges for golf lessons by the half-hour. For the first half-hour, he charges AED 80. He charges AED 20 more for each half-hour thereafter. When the student schedules the lesson, Jamaal clarifies that he charges AED 20 more for each half-hour after the first half-hour whether the lesson is scheduled the full half-hour or not. Describe the graph that shows the total charge for a lesson lasting x hours?

Drag and drop your answers to correctly complete the sentences.

It is



a graph of a step function.

The first horizontal line segment has

an open point at $(0, 80)$ and a closed point at $(0.5, 80)$ ✓

The next horizontal line segment has

an open point at $(0.5, 100)$ and a closed point at $(1, 100)$ ✓

a closed point at $(0, 80)$ and an open point at $(0.5, 80)$

an open point at $(0, 80)$ and a closed point at $(1, 80)$

an open point at $(1, 100)$ and a closed point at $(2, 100)$

is not

a closed point at $(0.5, 100)$ and an open point at $(1, 100)$

QUESTION 5



A boat club charges a fixed amount of AED 350 to rent a boat for up to 2 hours. An extra AED 50 will be charged for each hour over 2 hours. What is the function that shows the total charge (in AED) to rent a boat for x hours?

☒ $f(x) = \begin{cases} 350 & \text{if } 0 < x \leq 2 \\ 350 + 50(x - 2) & \text{if } x > 2 \end{cases}$ ✓

☐ $f(x) = \begin{cases} 350 & \text{if } 0 < x < 2 \\ 350 + 50x & \text{if } x \geq 2 \end{cases}$

☐ $f(x) = \begin{cases} 350 & \text{if } 0 < x < 2 \\ 350 + 50x & \text{if } x \geq 2 \end{cases}$

☐ $f(x) = \begin{cases} 350 & \text{if } 0 < x \leq 2 \\ 50x & \text{if } x \geq 2 \end{cases}$

☐ $f(x) = \begin{cases} 350 & \text{if } 0 < x \leq 2 \\ 50(x - 2) & \text{if } x > 2 \end{cases}$

QUESTION 6



Fatima owns a business where you can create a picture using small colorful tiles. She charges AED 100 for 1 to 50 tiles and AED 175 for 51 to 100 tiles. An extra AED 3 will be charged for each tile over 100 tiles. Write a function that shows the total charge (in AED) for using x tiles to create a picture.

Enter your answers in the spaces provided.

$f(x) = \{$

100



if

0



$< x \leq$

50



175



if

50



$< x \leq$

100



175

+

3



$(x -$

100

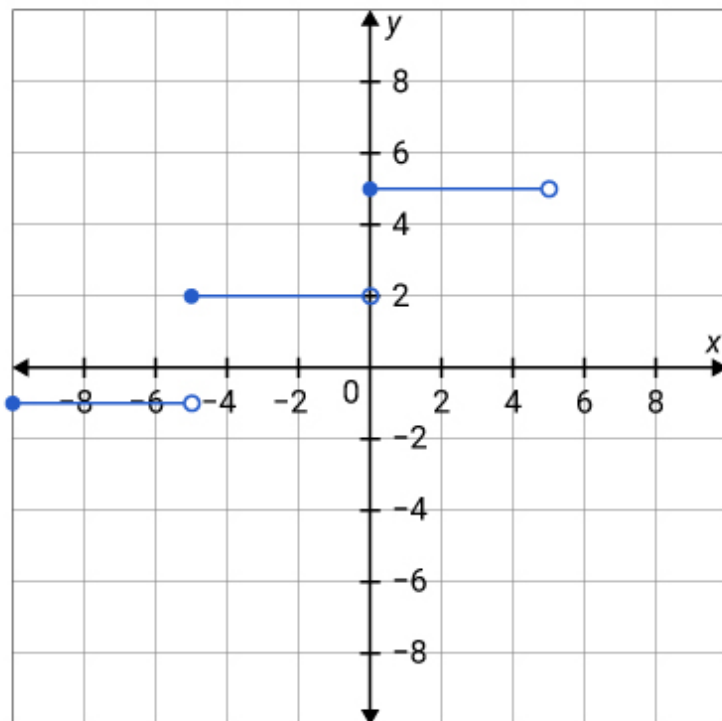


)
if
 $x >$
100

QUESTION 7



Which function represents this graph?



☒ $f(x) = \begin{cases} -1 & \text{if } -10 \leq x < -5 \\ 2 & \text{if } -5 \leq x < 0 \\ 5 & \text{if } 0 \leq x < 5 \end{cases}$



☐ $f(x) = \begin{cases} x-1 & \text{if } -10 < x \leq -5 \\ x+2 & \text{if } -5 < x \leq 0 \\ x+5 & \text{if } 0 < x \leq 5 \end{cases}$

☐ $f(x) = \begin{cases} -x & \text{if } -10 \leq x < -5 \\ 2x & \text{if } -5 \leq x < 0 \\ 5x & \text{if } 0 \leq x < 5 \end{cases}$

☐ $f(x) = \begin{cases} -10 & \text{if } -10 \leq x < -5 \\ -5 & \text{if } -5 \leq x < 0 \\ 0 & \text{if } 0 \leq x < 5 \end{cases}$

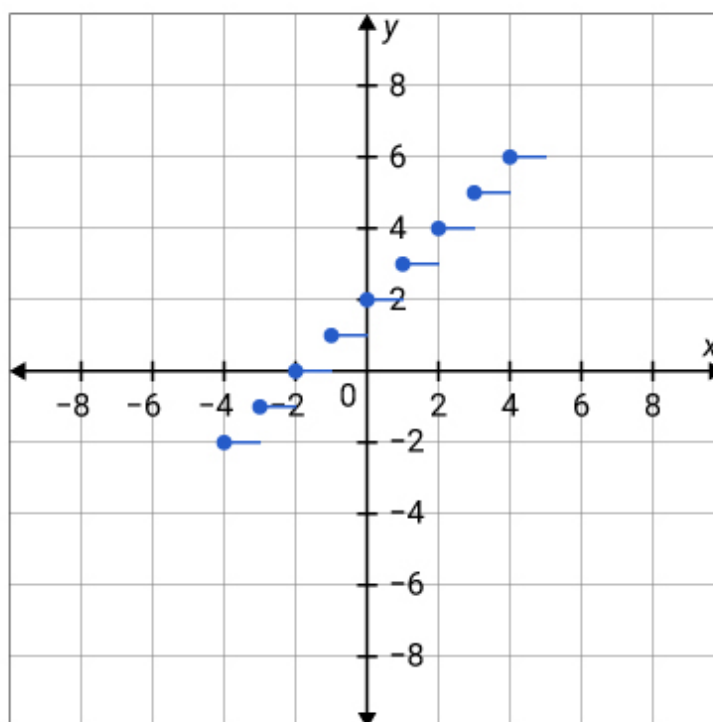
QUESTION 8



Which function represents this graph?

Select the correct answer from the drop-down menu.

This is the graph of



$f(x) = [[x]] + 2$ ✓ ▼

QUESTION 9



What is the domain and range of the function

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

?

Drag and drop your answers to correctly complete the sentences.

The domain is

$\{ x / x$

$\in \mathbb{R}$



The range is

$\{ f(x) / f(x)$

≤ 6



≥ -6

≥ 0

≤ 0

≥ 6

≤ -6

QUESTION 10



Which points lie on the graph of

$$f(x) = \lfloor x - 10 \rfloor$$

?

Select all that apply.

☐

$(0, -11)$

☐ $(-1.6, -11)$

☐ $(2.2, -7)$

☐ $(-2.8, -3)$

☒ $(11.4, 1)$



☒ $(1.5, -9)$



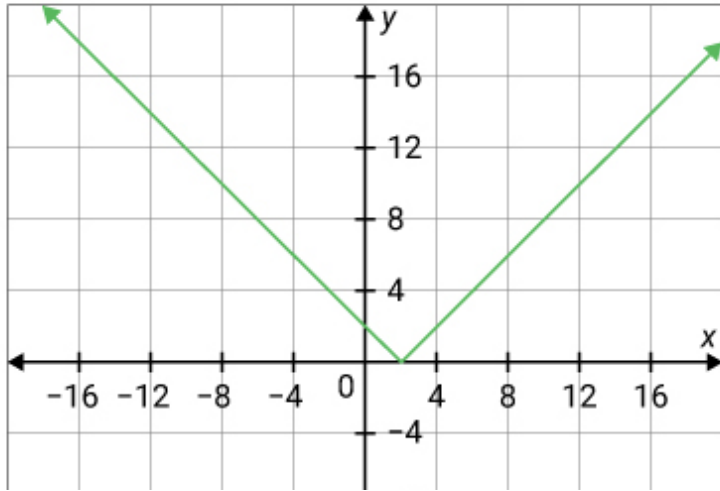
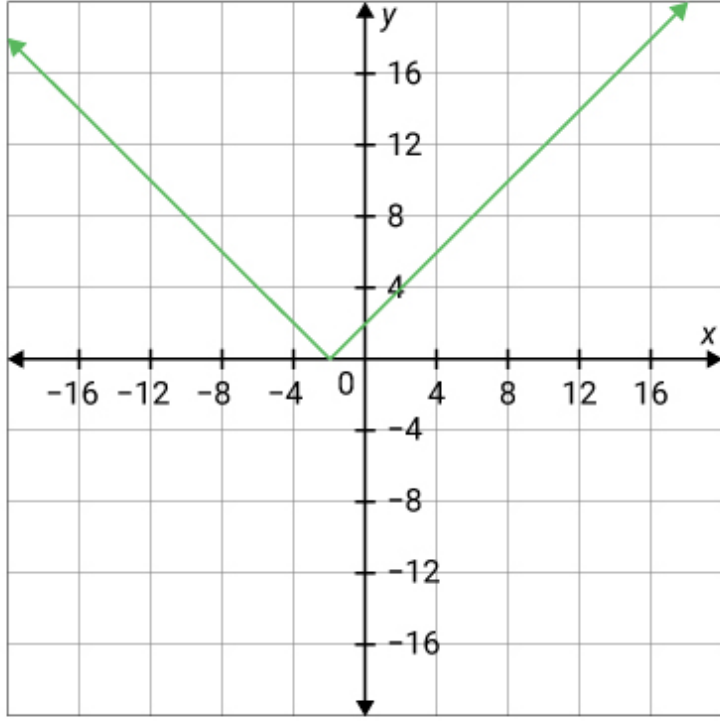
QUESTION 11

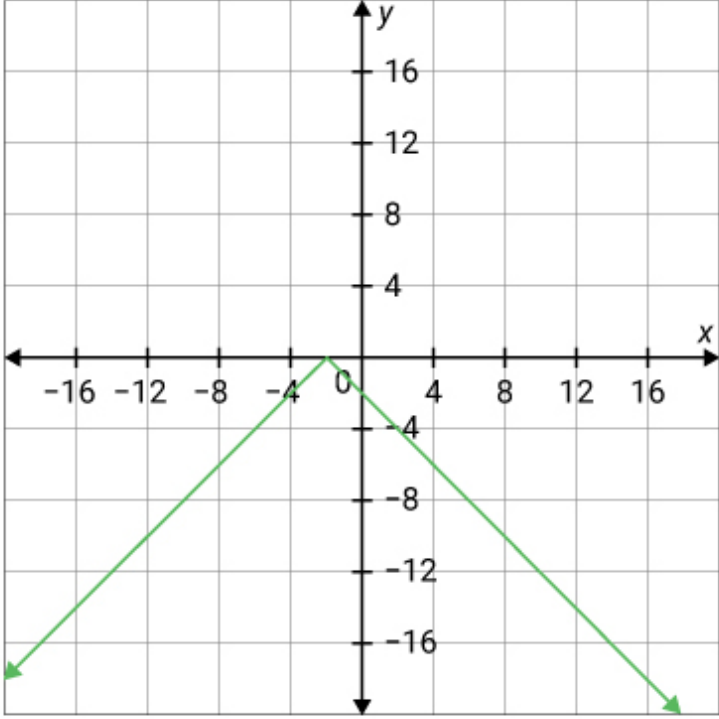
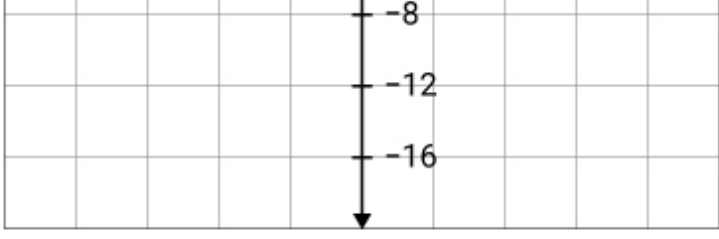


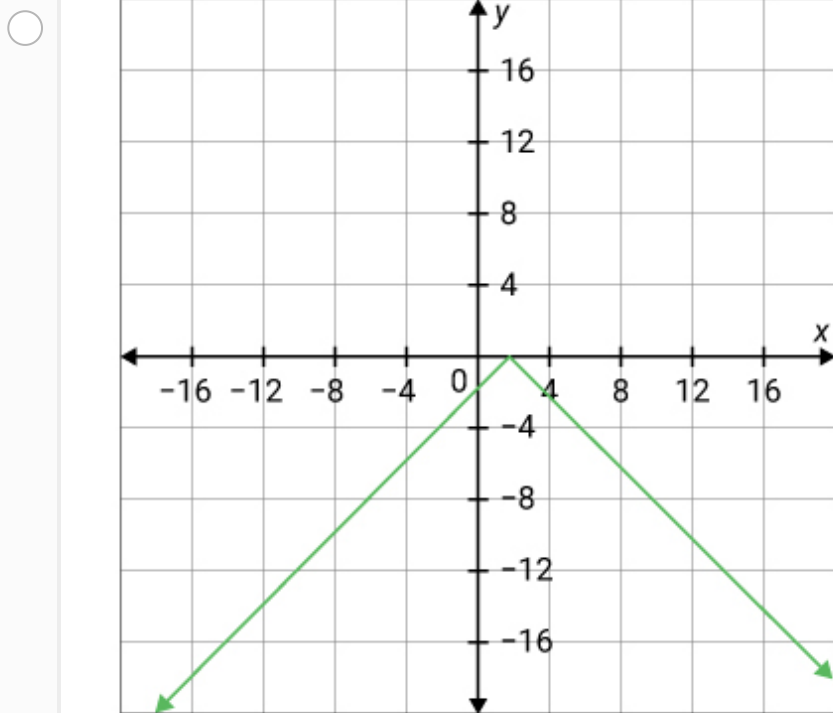
Which graph shows the function

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

?







QUESTION 12



Which function represents a step function?

☐
$$f(x) = \begin{cases} x & \text{if } x < -5 \\ 2x + 1 & \text{if } -5 \leq x < 5 \\ 4x^2 + 2 & \text{if } x \geq 5 \end{cases}$$

☐ $f(x) = \begin{cases} -2x & \text{if } x < -5 \\ x & \text{if } -5 \leq x < 2 \\ 3x & \text{if } x \geq 2 \end{cases}$

☐ $f(x) = \begin{cases} -3(x-4)^2 & \text{if } -5 \leq x < 0 \\ 3(x+2)^2 & \text{if } 0 \leq x < 5 \\ 9(x+8)^2 & \text{if } 5 \leq x < 10 \end{cases}$

☒ $f(x) = \begin{cases} -4 & \text{if } -1 \leq x < 2 \\ 1 & \text{if } 2 \leq x < 5 \\ 6 & \text{if } 5 \leq x < 8 \end{cases}$ ✓

QUESTION 13



Which functions are piecewise-linear functions?
Select all that apply.

☐ $f(x) = \begin{cases} x^2 - 1 & \text{if } x \leq -3 \\ x + 2 & \text{if } -3 < x < 2 \\ \sqrt{x} & \text{if } x \geq 2 \end{cases}$

☐ $f(x) = \begin{cases} x & \text{if } x \leq -3 \\ x + 2 & \text{if } -3 < x < 2 \\ \sqrt{x} & \text{if } x \geq 2 \end{cases}$



$$f(x) = \begin{cases} x & \text{if } x \leq -3 \\ x + 2 & \text{if } -3 < x < 2 \\ x - 5 & \text{if } x \geq 2 \end{cases}$$



$$f(x) = \begin{cases} 3x & \text{if } x \leq -3 \\ 2 & \text{if } -3 < x < 2 \\ x + 4 & \text{if } x \geq 2 \end{cases}$$



$$f(x) = \begin{cases} x^2 & \text{if } x \leq -3 \\ x + 2 & \text{if } -3 < x < 2 \\ x - 5 & \text{if } x \geq 2 \end{cases}$$



$$f(x) = \begin{cases} x & \text{if } x \leq -3 \\ x^2 + 2 & \text{if } -3 < x < 2 \\ x - 5 & \text{if } x \geq 2 \end{cases}$$

QUESTION 14



Complete this piecewise-linear function.

Drag and drop your answers to correctly complete this function.

$$f(x) = \{$$

$$\frac{1}{2}x + 4$$

if

$$x \leq -2$$

$$5 - 4x$$

if

$$-2 < x \leq 4$$

$$-3$$

$$(x + 8)$$

if

$$x > 4$$

$$\frac{9}{x} - 5$$

$$(x^3 - 1)$$

$$(x + 2)^2$$

$$6\sqrt{x}$$

QUESTION 15



Drag and drop your answers to correctly complete the sentences.

The function

$$f(x) = \lfloor x \rfloor$$

is a special kind of

step



function.

The symbol

$$\lfloor x \rfloor$$

means the

greatest



integer

less than or equal to



x

.

So,

$$f(6.75) =$$

$$[[6.75]]$$

=

6



and

$$f(-7.48) =$$

$$[[-7.48]]$$

=

-8



greater than or equal to

-7

quadratic

least

7

QUESTION 16



Complete the piecewise-linear function.

Select the correct answer from the drop-down menu.

$$f(x) = \begin{cases}$$

$$8 - 7x \quad \text{if } x < 0$$

9

$$\text{if } x \geq 0$$



QUESTION 17



Write the piecewise-defined function shown on this graph.
Drag and drop your answers to correctly complete the function.

$$-\frac{1}{2}x + 6$$

✓

if $x < -2$

$f(x) = \{$

$$\frac{1}{2}x^3 + 1$$

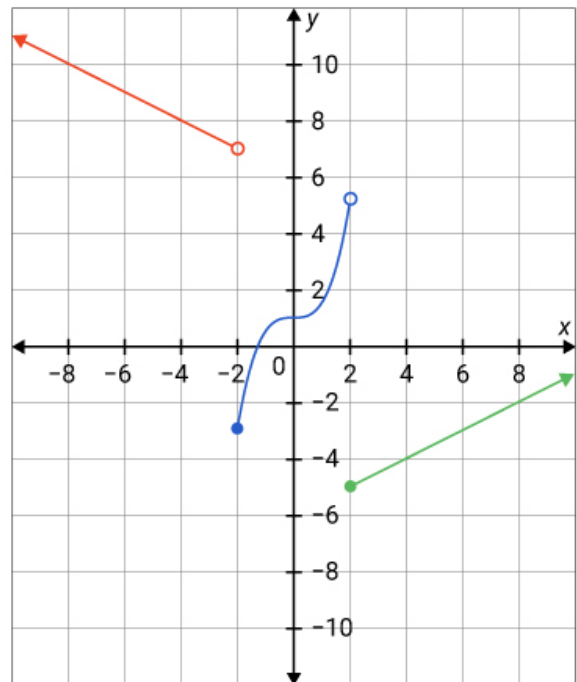
✓

if $-2 \leq x < 2$

$$\frac{1}{2}x - 6$$

✓

if $x \geq 2$



$$-\frac{1}{2}x - 6$$

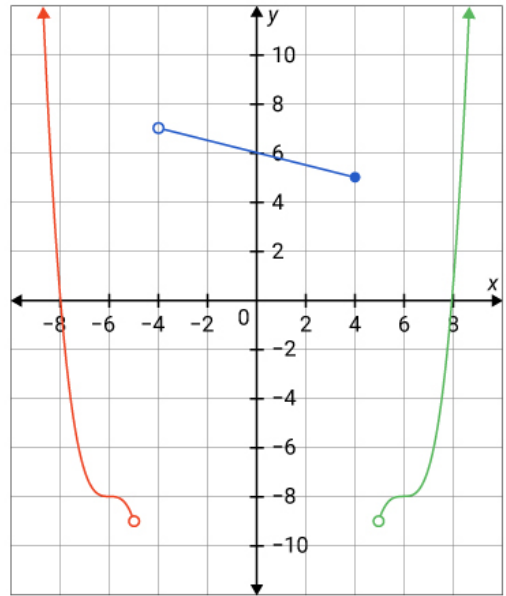
$$\frac{1}{2}x + 6$$

$$\frac{1}{2}x^3 - 1$$

QUESTION 18



What is the piecewise-defined function shown on this graph?



☐
$$f(x) = \begin{cases} -(x+6)^3 - 8 & \text{if } x < -5 \\ -\frac{1}{4}x + 6 & \text{if } -4 \leq x \leq 4 \\ -(x-6)^3 - 8 & \text{if } x > 5 \end{cases}$$

☐
$$f(x) = \begin{cases} (x+6)^3 - 8 & \text{if } x < -5 \\ \frac{1}{4}x + 6 & \text{if } -4 < x \leq 4 \\ (x-6)^3 - 8 & \text{if } x > 5 \end{cases}$$

$$f(x) = \begin{cases}$$

- ☒ $-(x+6)^3 - 8$ if $x < -5$
- $-\frac{1}{4}x + 6$ if $-4 < x \leq 4$
- $(x-6)^3 - 8$ if $x > 5$



- $f(x) = \begin{cases}$
- ☐ $-(x-6)^3 - 8$ if $x \leq -5$
- $\frac{1}{4}x - 6$ if $-4 < x \leq 5$
- $-(x-6)^3 + 8$ if $x > 5$

QUESTION 19



Identify the piecewise-defined function shown in this graph.

Enter your answers in the spaces provided.

$f(x) = \{$

$3x +$

9



if

$x \leq -$

3



$\sqrt{x+3} +$

1



if

—

3



$< x \leq$

1

$3x -$

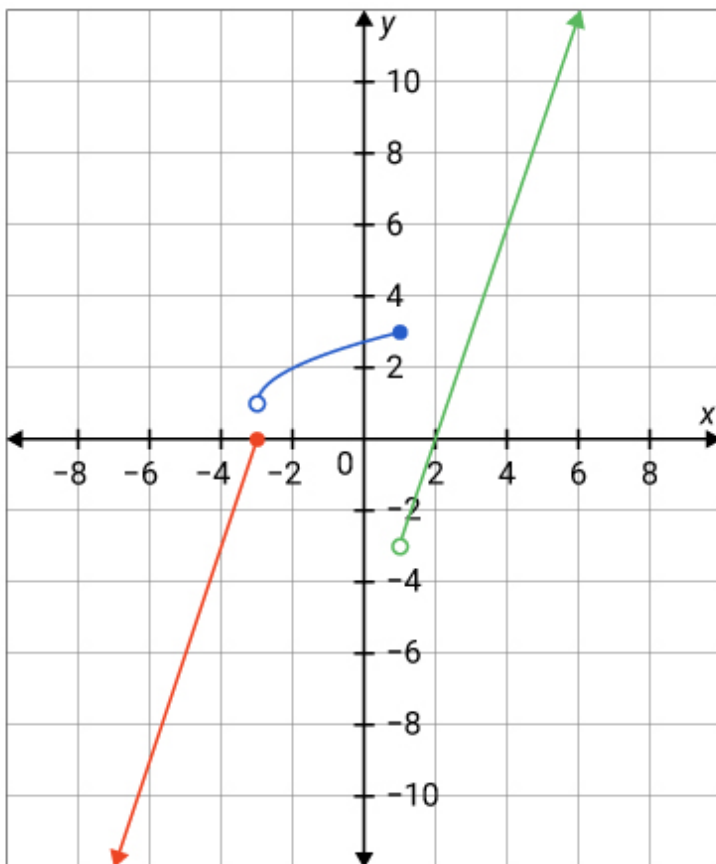
6



if

$x >$

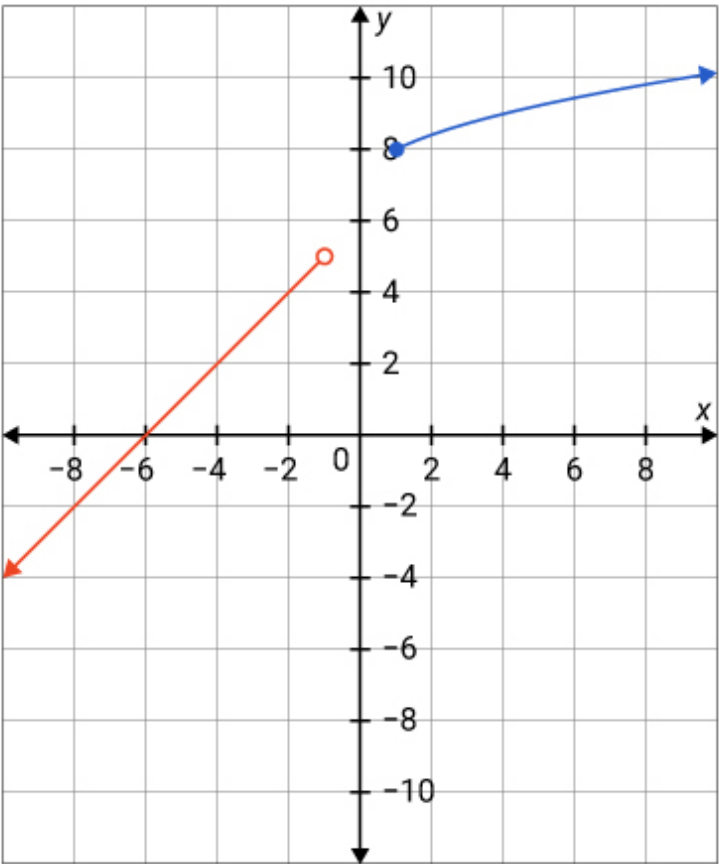
1



Determine the piecewise-defined function for this graph.

Select the correct answer from the drop-down menu.

$f(x) = \left\{ \right.$



$$\begin{cases} x + 6 & \text{if } x < -1 \\ \sqrt{x} + 7 & \text{if } x \geq 1 \end{cases}$$

✓ ▼

QUESTION 21

What is the piecewise-defined function for this graph?

Drag and drop your answers to correctly complete the function

$f(x)$

.

$f(x) = \{$

$-x^2 + 8$ ✓

if

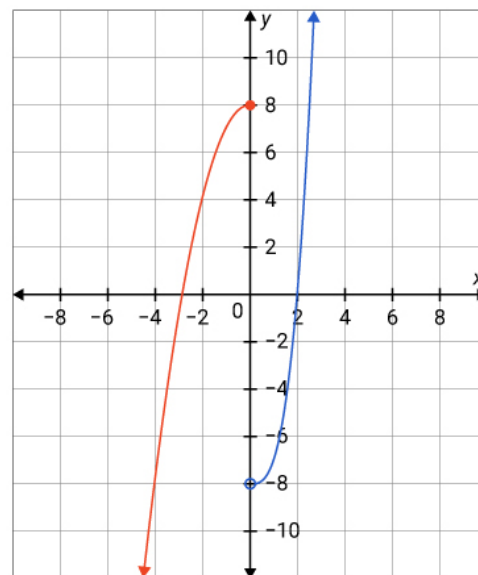
$x \leq$

0 ✓

$x^3 - 8$ ✓

if

$x > 0$ ✓



$x^2 - 8$

8

$-x^3 - 8$

$x \geq 0$

$-x^3 + 8$

$x^2 + 8$

QUESTION 22

Write the piecewise-defined function for the given graph.

Drag and drop your answers to correctly complete the piecewise-defined function.

$f(x) = \{$

$x - 2$ ✓

if

$x <$

1 ✓

$\sqrt{x}$



if

$x \geq 1$



$x - 1$

$x > 1$

$\sqrt{x + 1}$

$x - 3$

$x \leq 1$

$\sqrt{x - 1}$

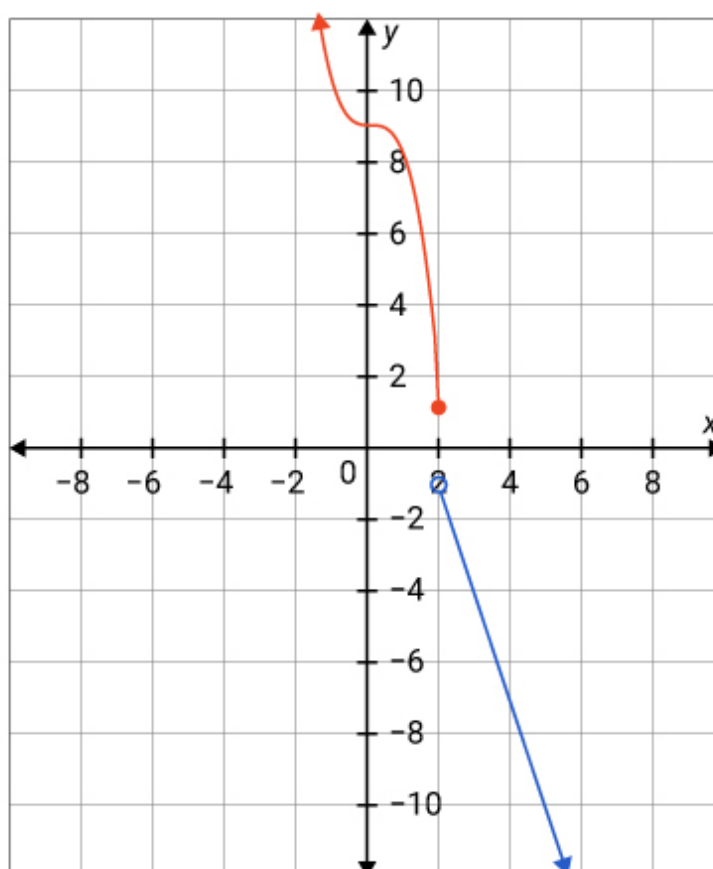
QUESTION 23



What is the piecewise-defined function shown in this graph?

Select the correct answer from the drop-down menu.

$$f(x) = \left\{ \right.$$



$$-x^3 + 9 \text{ if } x \leq 2$$

$$-3x + 5 \text{ if } x > 2$$



QUESTION 24



Determine the piecewise-defined function for this graph.
Enter your answers in the spaces provided.

$$f(x) = \{$$

$$x^2 -$$

10



if

$$x <$$

4



$$5x -$$

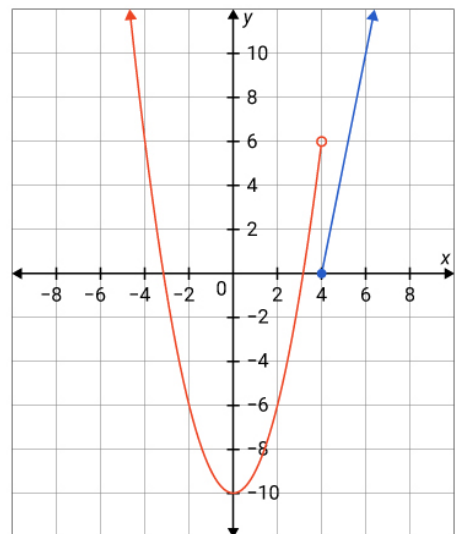
20



if

$$x \geq$$

4



QUESTION 25



Determine the piecewise-defined function

$f(x)$

for this graph.

Drag and drop your answers to correctly complete the function.

Choose the rules and domains in this order:
red, blue then green.

$f(x) = \{$

$-3x + 1$



if

$x < -1$



2



if

$-1 \leq x < 5$

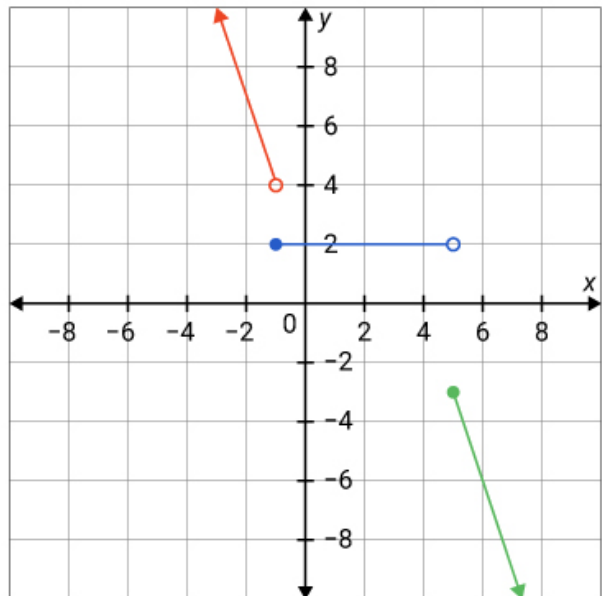


$-3x + 12$



if

$x \geq 5$



$-3 \leq x \leq 4$

$x > 4$

$3x + 2$

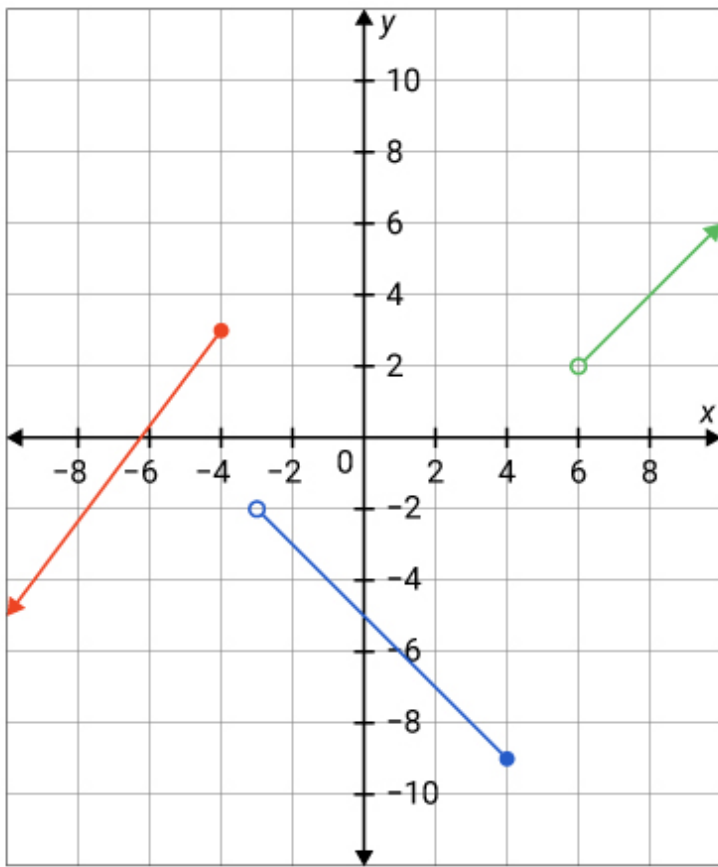
$3x + 8$

$x \leq -3$

QUESTION 26



Which rules define pieces of the piecewise-defined function shown in this graph?



$x + 4 \text{ if } x > 4$



$x - 5 \text{ if } -3 < x \leq 6$



$-x + 5 \text{ if } -3 < x \leq 4$



$x - 4 \text{ if } x > 6$



$x + 7 \text{ if } x < -4$



$-x - 5 \text{ if } -3 < x \leq 4$



$x + 7 \text{ if } x \leq -4$





$$-x - 4 \text{ if } x > 6$$

QUESTION 27



Determine the piecewise-defined function for the given graph.

Enter your answers in the spaces provided.

$$f(x) = \{$$

-5



if

$x \leq$

-4



2



x

if

-4



$< x \leq$

5



-2



$x +$

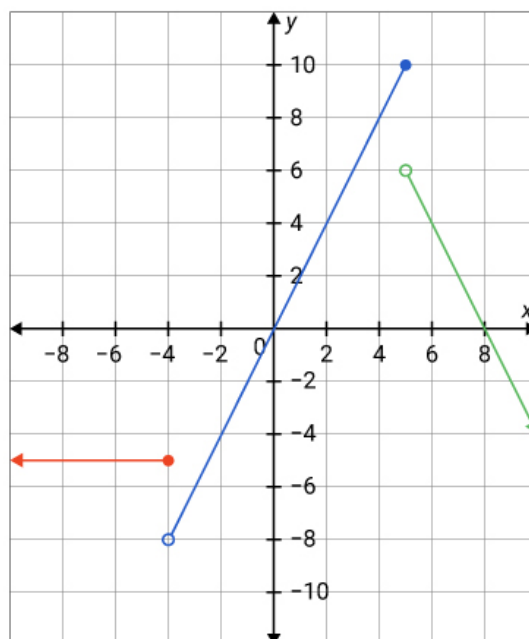
16



if

$x >$

5



QUESTION 28



Write the piecewise-defined function for this graph.

Select the correct answer from the drop-down menu.

$$x - 9 \quad \checkmark \quad \blacktriangledown \quad \text{if}$$

$$x \leq -2$$

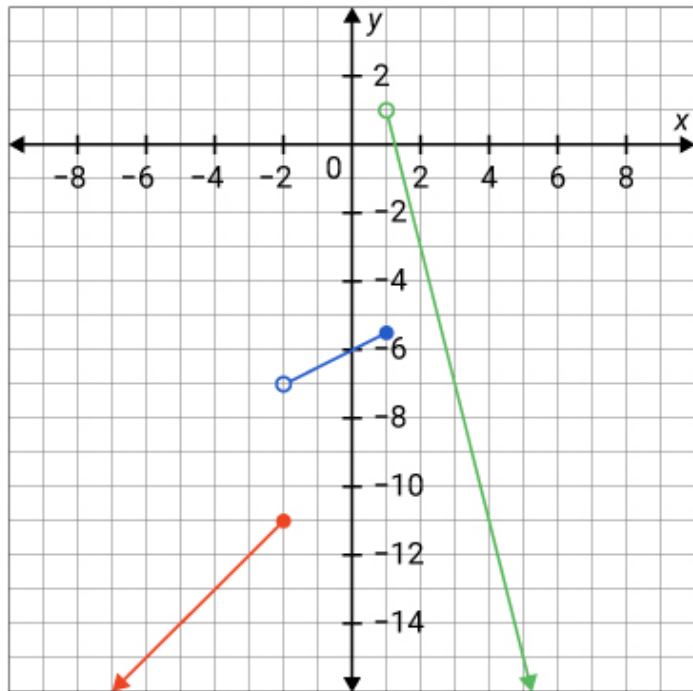
$$f(x) = \{$$

$$\frac{1}{2}x - 6 \quad \checkmark \quad \blacktriangledown \quad \text{if}$$

$$-2 < x \leq 1$$

$$-4x + 5 \quad \checkmark \quad \blacktriangledown \quad \text{if}$$

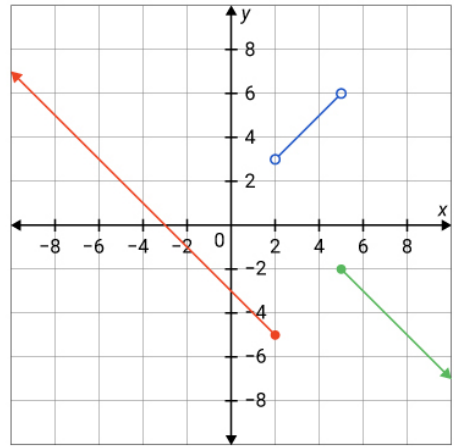
$$x > 1$$



QUESTION 29



Which function does this graph represent?



☐ $f(x) = \begin{cases} x + 3 & \text{if } x \leq 2 \\ x + 1 & \text{if } 2 < x < 5 \\ x - 3 & \text{if } x \geq 5 \end{cases}$

☐ $f(x) = \begin{cases} x + 3 & \text{if } x < 2 \\ x + 1 & \text{if } 2 \leq x < 5 \\ x - 3 & \text{if } x \geq 5 \end{cases}$

☒ $f(x) = \begin{cases} -x - 3 & \text{if } x \leq 2 \\ x + 1 & \text{if } 2 < x < 5 \\ -x + 3 & \text{if } x \geq 5 \end{cases}$ ✓

☐ $f(x) = \begin{cases} -x - 3 & \text{if } x < 2 \\ x + 1 & \text{if } 2 \leq x \leq 5 \\ -x + 3 & \text{if } x \geq 5 \end{cases}$