

Writing Piecewise Functions

Example 1

Write a piecewise equation to represent the given function.

x-coordinate of point of discontinuity: -1

LEFT PIECE:

RIGHT PIECE:

m slope: -1

slope: 1

b y-intercept: (0, -2)

y-intercept: (0, 3)

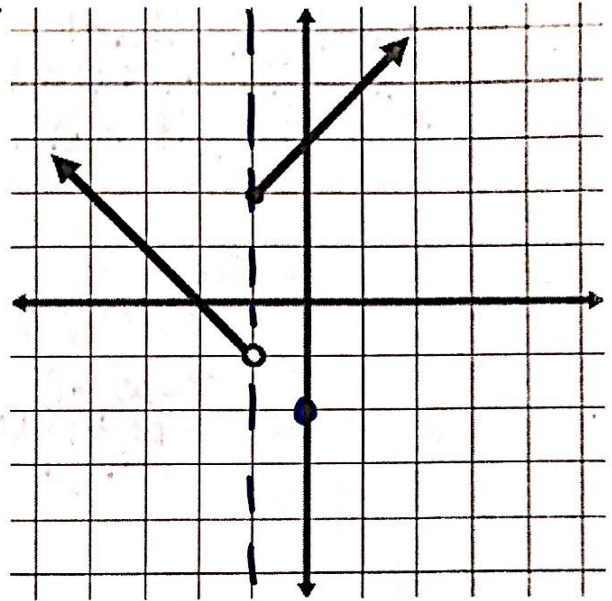
equation: $y = -x - 2$

equation: $y = x + 3$

domain: $x < -1$

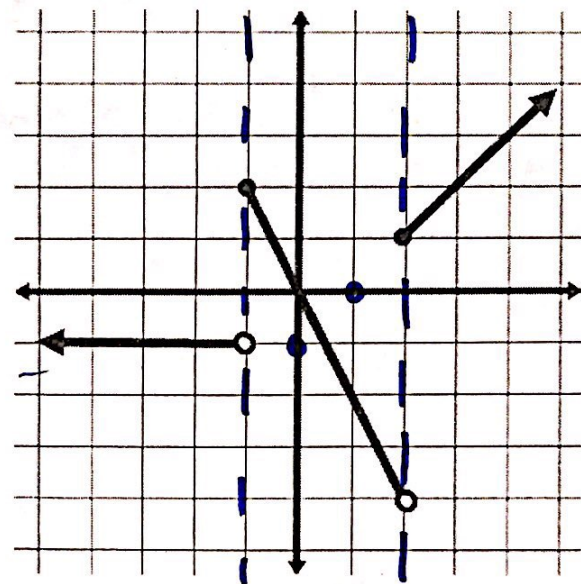
domain: $x \geq -1$

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



Example 2: You Try!!

Write a piecewise equation to represent the given function.



x-coordinate of point of discontinuity: -1, 2

LEFT:

MIDDLE:

RIGHT:

slope: zero

slope: -2

slope: 1

y-intercept: (0, -1)

y-intercept: (0, 0)

y-intercept: (0, -1)

equation: $y = -1$

equation: $y = -2x$

equation: $y = x - 1$

domain: $x < -1$

domain: $-1 \leq x < 2$

domain: $x \geq 2$

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

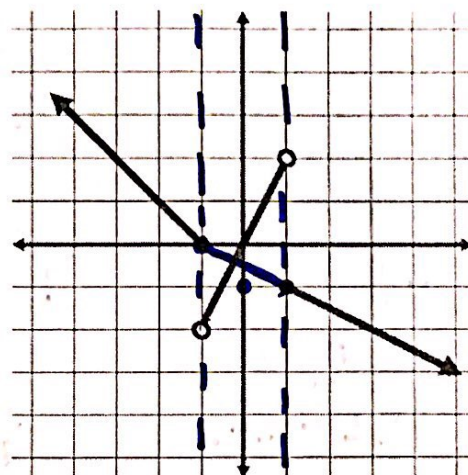
Piecewise Characteristics

Example 1

$$f(x) = \begin{cases} -x-1, & \text{if } x \leq -1 \\ 2x, & \text{if } -1 < x < 1 \\ -\frac{1}{2}x - \frac{1}{2}, & \text{if } x \geq 1 \end{cases}$$

Analyze the characteristics of the function shown in the graph.

- domain: $(-\infty, \infty)$
- range: $(-\infty, \infty)$
- x-intercept(s): $(-1, 0)$ $(0, 0)$
- y-intercept: $(0, 0)$
- interval of increase: $(-1, 1)$
- interval of decrease: $(-\infty, -1) \cup (1, \infty)$
- point(s) of discontinuity: $-1, 1$

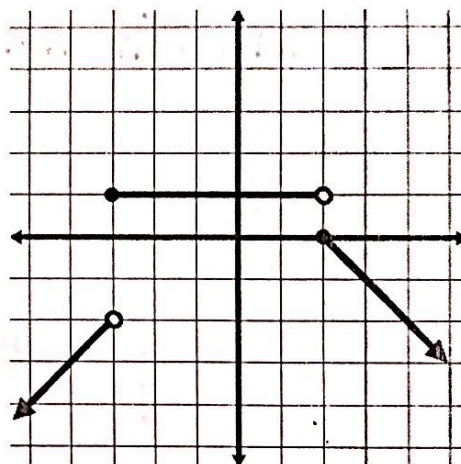


Example 2

$$f(x) = \begin{cases} \underline{\hspace{2cm}} \\ \underline{\hspace{2cm}} \\ \underline{\hspace{2cm}} \end{cases}$$

Analyze the characteristics of the function shown in the graph.

- domain: _____
- range: _____
- x-intercept(s): _____
- y-intercept: _____
- interval of increase: _____
- interval of decrease: _____
- point(s) of discontinuity: _____



Example 3: YOU TRY!!

$$f(x) = \begin{cases} \underline{\hspace{2cm}} \\ \underline{\hspace{2cm}} \end{cases}$$

Analyze the characteristics of the function shown in the graph.

- domain: _____
- range: _____
- x-intercept(s): _____
- y-intercept: _____
- interval of increase: _____
- interval of decrease: _____
- point(s) of discontinuity: _____

