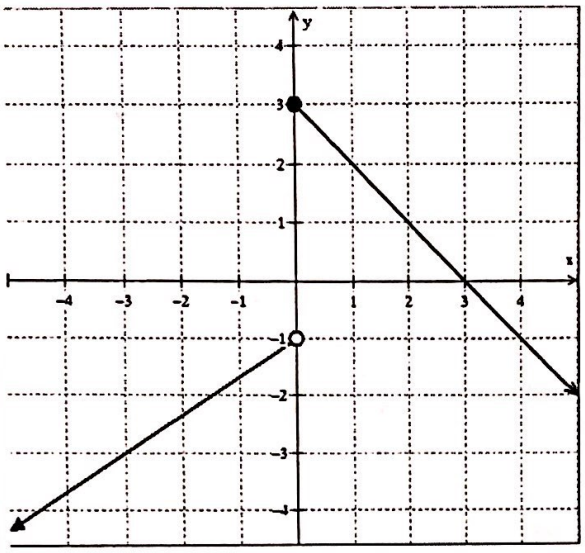
3.3 Piecewise Functions

NOTES

Write your questions here!

Piecewise Functions –



Algebraically

$$f(x) = \begin{cases} 2x + 8, & x \le -2 \\ x^2 - 3, & -2 < x \le 3 \\ \sqrt{x+3}, & x > 3 \end{cases}$$

$f(-4) =$	$f(6) =$	$f(-2) =$	$f(0) =$
$2f(-4) =$	$f(6)+3 =$	$f(-2)+4f(-4)$	$3f(0)-f(6)$

TRY IT!

$$f(x) = \begin{cases} 2x^3 - 1, & x < 1 \\ 3, & 1 \le x < 5 \\ |x-2|, & x \ge 5 \end{cases}$$

$f(8) =$	$f(0) =$	$f(4) =$	$f(5) =$
$-3f(8)$	$2f(0)+4$	$f(4)+2f(0)$	$2f(5)-3f(7)$

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Domain:

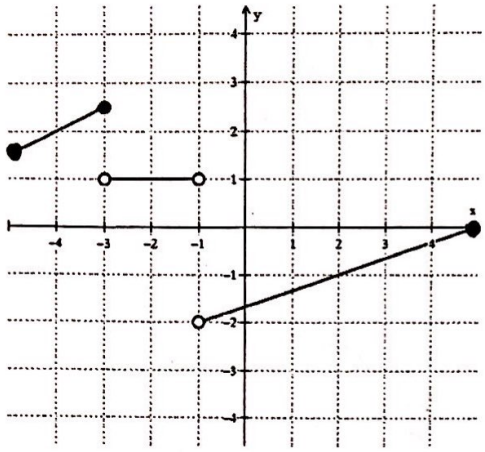
Range:

Incr:

Decr:

Constant:

Graphically



$f(2) =$

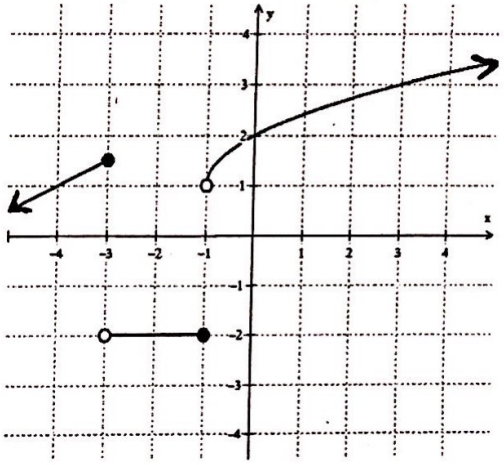
$f(-3) =$

$f(-1) =$

$f(-4) =$

$f(x) = 2 \quad x =$ ____

$f(x) = -2 \quad x =$ ____



$f(0) =$

$f(-4) =$

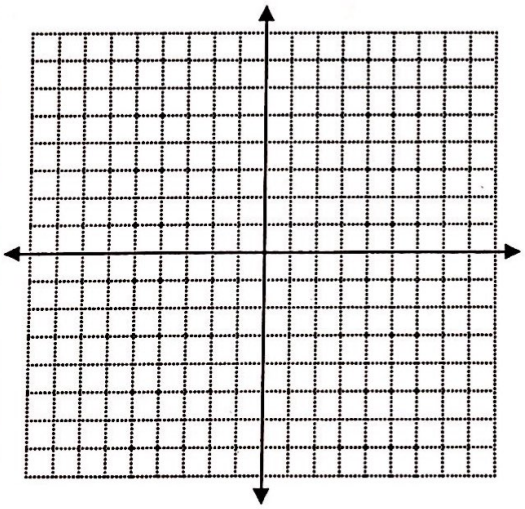
$f(-1) =$

$f(3) =$

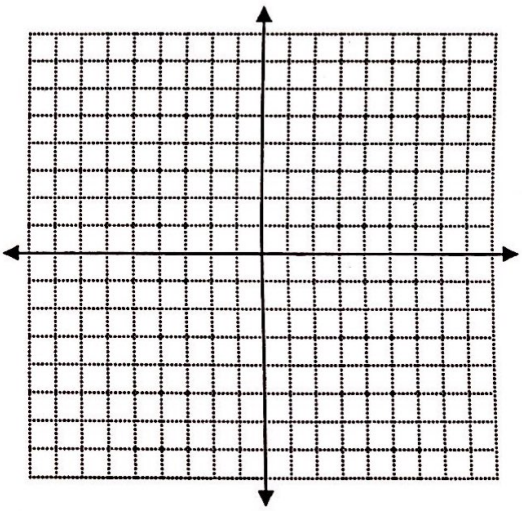
$f(x) = 1 \quad x =$ ____

TRY IT!

$$f(x) = \begin{cases} -2x + 1, & x < 0 \\ \frac{2}{3}x - 3, & x \geq 0 \end{cases}$$



$$f(x) = \begin{cases} 5, & x \leq 2 \\ 2x - 4, & x > 2 \end{cases}$$



SUMMARY:

Now, summarize your notes here!

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3.3 Piecewise Functions

PRACTICE

Use the piecewise function to evaluate the following.

1.

$$f(x)=\begin{cases}-2x^2-1, & x\le 2\\ \frac{4}{5}x-4, & x>2\end{cases}$$

a. $f(0)=$ b. $f(5)=$

c. $f(2)=$ d. $f(-3)=$

e. $f(2)-3f(0)=$

2.

$$f(x)=\begin{cases}x^3-7x, & x\le -3\\ 8, & -3<x\le 3\\ \sqrt{2x+3}, & x>3\end{cases}$$

a. $f(-5)=$ b. $f(11)=$

c. $f(0)=$ d. $f(3)=$

e. $2f(11)+3f(0)=$

3.

$$f(x)=\begin{cases}\frac{3}{x+4}, & x<-5\\ x^2-3x, & -5<x\le 0\\ x^4-7, & x>0\end{cases}$$

a. $f(-1)=$ b. $f(4)=$

c. $f(-10)=$ d. $f(0)=$

e. $3f(-1)-f(4)=$

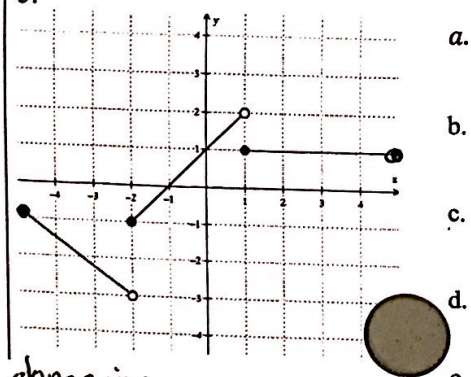
4.

$$f(x)=\begin{cases}|2x+7|, & x\le -4\\ 1+x^2, & -4<x\le 1\\ 6, & 1<x<3\\ \frac{1}{3}x+8, & x\ge 3\end{cases}$$

a. $f(5)=$ b. $f(1)=$

c. $f(-4)=$ d. $f(2)=$

5.



domain:

range:

a. $f(-1)=$

b. $f(2)=$

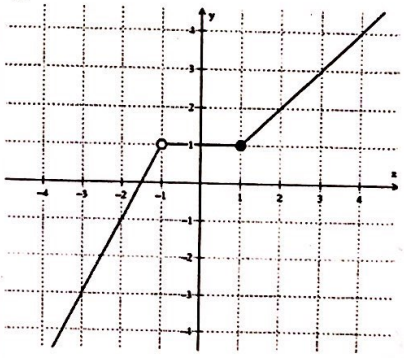
c. $f(1)=$

d. $f(-2)=$

e. $f(0)=$

f. $f(x)=0$

6.



a. $f(-3)=$

b. $f(4)=$

c. $f(1)=$

d. $f(-1)=$

e. $f(0)=$

f. $f(x)=-1$

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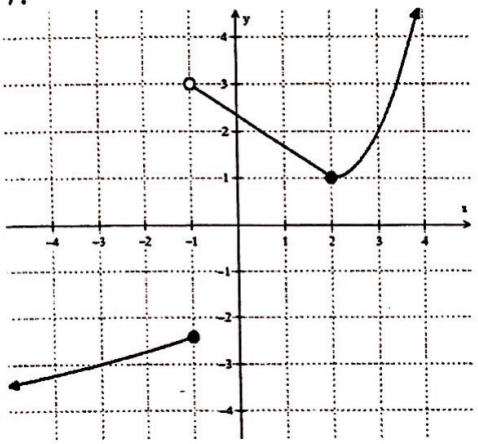
7.



a. $f(3) =$

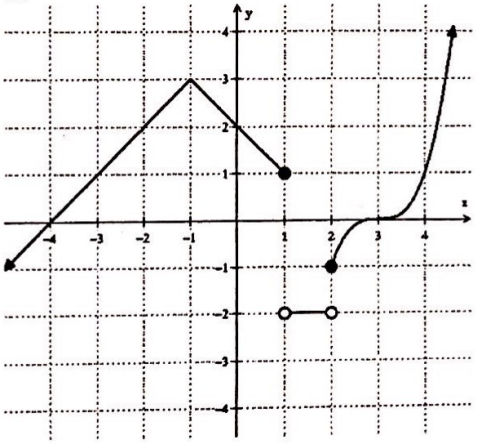
b. $f(-1) =$

c. $f(-3) =$

d. $f(2) =$

e. $f(0.5) =$

8.



a. $f(-4) =$

b. $f(1) =$

c. $f(3) =$

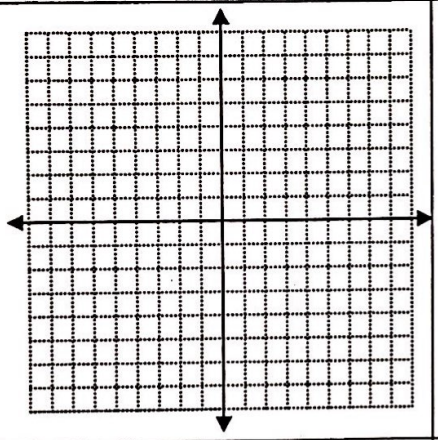
d. $f(2) =$

e. $f(1.5) =$

Graph the following piecewise functions.

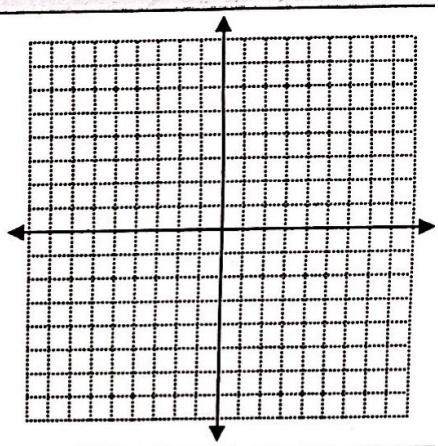
9.

$$f(x) = \begin{cases} 2x+3, & x \le 0 \\ \frac{1}{2}x - 1, & x > 0 \end{cases}$$



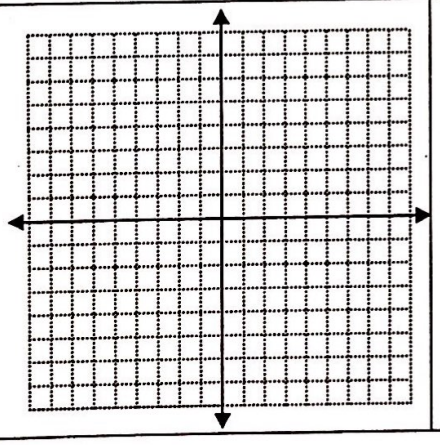
10.

$$f(x) = \begin{cases} -\frac{1}{3}x - 1, & x \le 3 \\ 2, & x > 3 \end{cases}$$



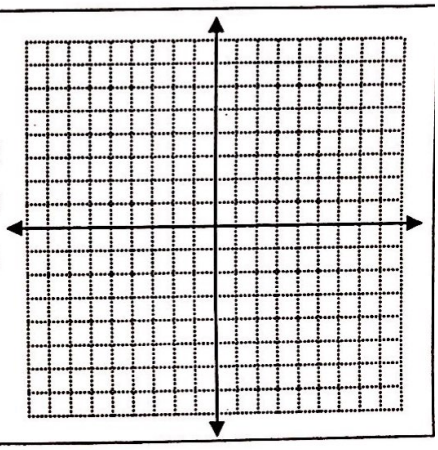
11.

$$f(x) = \begin{cases} 4 - x, & x < 2 \\ 2x - 6, & x \ge 2 \end{cases}$$



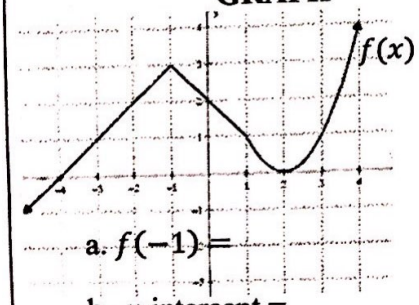
12.

$$f(x) = \begin{cases} \frac{2}{3}x + 3, & x \le 0 \\ 3, & 0 < x < 2 \\ -\frac{1}{2}x, & x \ge 2 \end{cases}$$



ALGEBRA SKILLZ!

GRAPH



a. $f(-1) =$

b. y-intercept =

c. $f(x) = 1$ when $x =$

d. x-intercept(s) =

SIMPLIFY

Simplify the radical.

a. $\sqrt{24}$

b. $4\sqrt{40}$

SOLVE

Solve for x.

a. $15 = \frac{5}{x} + 4$

FACTOR

b. $x^2 - 12x + 35$

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