

# Piecewise Functions

1. Evaluate the function at the specified values.

$f(x) = \begin{cases} -2, & x < 4 \\ \frac{3}{5}x - 5, & 4 \leq x < 6 \\ x, & x \geq 6 \end{cases}$	$g(x) = [x]$
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- |   |  |
|---|--|
| <p>a) <math>f(5)</math></p> <p>b) <math>f(.4)</math></p> <p>c) <math>f\left(\frac{7}{5}\right)</math></p> <p>d) <math>f(8)</math></p> | <p>e) <math>g(0.8)</math></p> <p>f) <math>g(-3.7)</math></p> <p>g) <math>g(6)</math></p> <p>h) <math>g(-0.1)</math></p> <p>i) <math>f(\pi) + g(\pi)</math></p> |
|---|--|

Sketch each function. Identify the domain and range in interval notation.

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

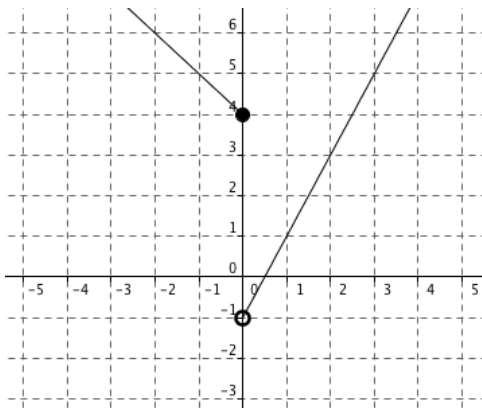
3.  $f(x) = \begin{cases} 3x+5, & x < -3 \\ 2, & x = -3 \\ x-4, & x > -3 \end{cases}$

4.  $f(x) = \begin{cases} -3, & x \leq 2 \\ x+2, & 2 < x \leq 4 \\ 3x-6, & x > 4 \end{cases}$

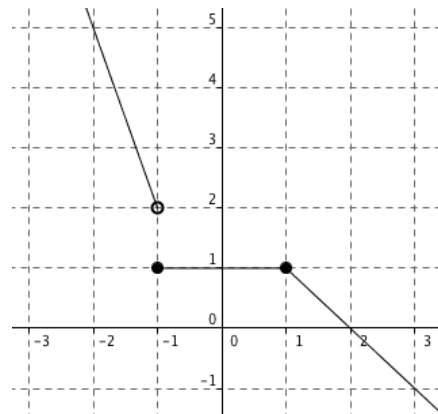
5.  $f(x) = \begin{cases} \sqrt{1-(x+4)^2}, & -5 \leq x < -4 \\ x+3, & -4 \leq x \leq 0 \\ -|x-4|, & x > 0 \end{cases}$

Write the equation for each piecewise function. Then state the domain and range in set notation.

6.



7.



Sketch each function. Then rewrite each function as a piecewise function.

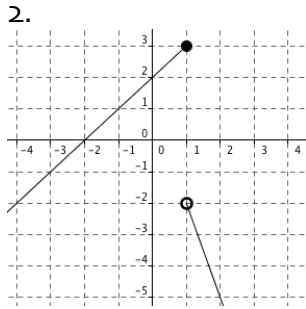
8.  $f(x) = |x+2| - 1$

9.  $f(x) = -|3x| + 1$

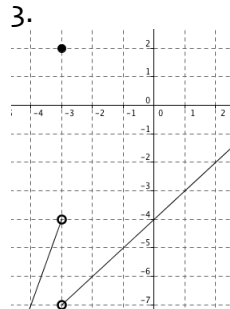
10.  $f(x) = |2x-4| + 5$

# ANSWERS

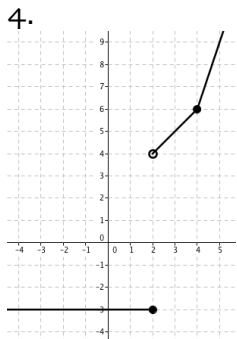
1. a) -2    b) -2    c) -2    d) 8    e) 0    f) -4    g) 6    h) -1    i) 1



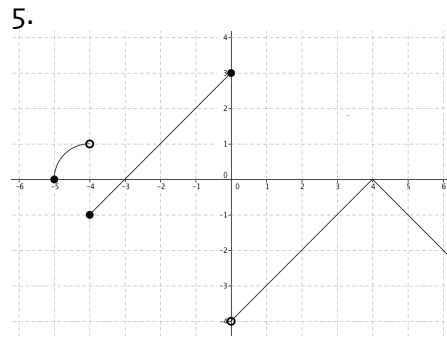
D:  $(-\infty, \infty)$   
R:  $(-\infty, 3]$



D:  $(-\infty, \infty)$   
R:  $(-\infty, \infty)$



D:  $(-\infty, \infty)$   
R:  $[-3] \cup (4, \infty)$



D:  $[-5, \infty)$   
R:  $(-\infty, 3]$

6.

$$f(x) = \begin{cases} -x+4, & x \leq 0 \\ 2x-1, & x > 0 \end{cases}$$

D:  $\{x|x \in \mathbb{R}\}$   
R:  $\{y|y > -1\}$

7.

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

D:  $\{x|x \in \mathbb{R}\}$   
R:  $\{y|y \leq 1 \text{ or } y > 2\}$

