

Name ANS Key  
 Period \_\_\_\_\_

### Worksheet - Piecewise Functions

Evaluate the following for  $f(x) = \begin{cases} 3x-5, & x > 4 \\ x^2, & x \leq 4 \end{cases}$ :

1.  $f(7)$

16

2.  $f(4)$

16

3.  $f(-3)$

9

Evaluate the following for  $f(x) = \begin{cases} -2|x+1|, & x \leq 1 \\ 3, & 1 < x < 3 \\ 6-2x, & x \geq 3 \end{cases}$ :

4.  $f(10)$

6-20  
-14

5.  $f(2)$

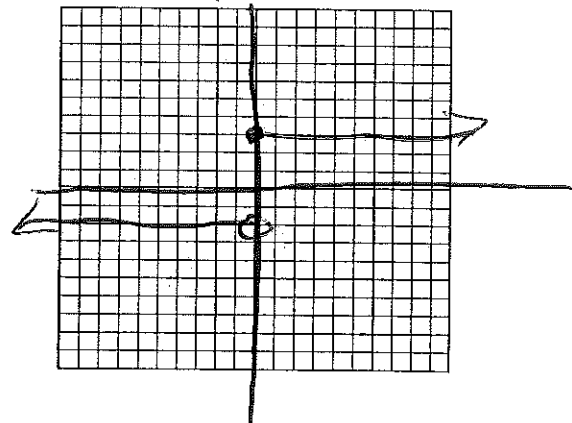
3

6.  $f(0)$

-2

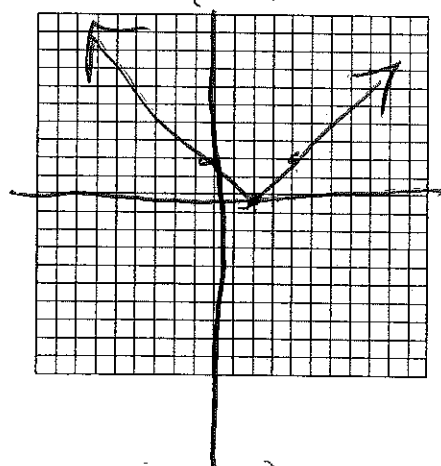
Graph the following piecewise functions. Then find the domain, range, and zeros for each. (Interval Notation)

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



$D = (-\infty, \infty)$   
 $R = \{-2, 3\}$   
 zeros =  $\emptyset$

8.  $g(x) = \begin{cases} -x+2, & x < 2 \\ x-2, & x \geq 2 \end{cases}$



$D = (-\infty, \infty)$   
 $R = (0, \infty)$   
 zeros =  $\{2\}$

$$\begin{array}{r} -x+2 \\ 2 \overline{) 0} \\ 0 \phantom{0} \\ \hline 0 \phantom{0} \\ 0 \phantom{0} \\ \hline 0 \phantom{0} \end{array}$$

$$\begin{array}{r} x-2 \\ 2 \overline{) 0} \\ 4 \phantom{0} \\ \hline 0 \phantom{0} \end{array}$$

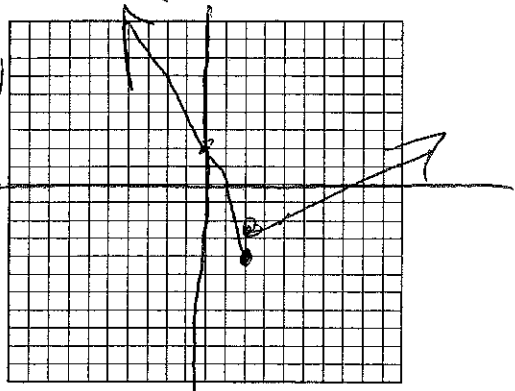
$$\begin{array}{r} -3x+2 \\ 2 \overline{) -4} \\ 0 \end{array}$$

$$\begin{array}{r} \frac{1}{2}x-4 \\ 2 \overline{) -3} \\ 4 \end{array}$$

$$\begin{array}{r} -3x+2=0 \\ -3x=-2 \\ \underline{-3} \quad \underline{-3} \\ x=2/3 \end{array}$$

9.  $h(x) = \begin{cases} -3x+2, & x \leq 2 \\ \frac{1}{2}x-4, & x > 2 \end{cases}$

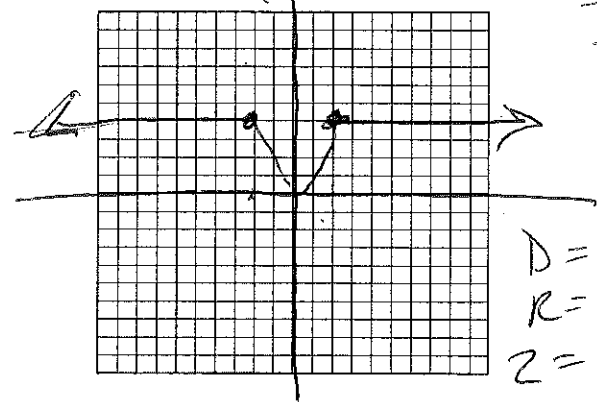
$D = (-\infty, \infty)$   
 $R = [-4, \infty)$   
 $Z = \{2/3, 8\}$



10.  $f(x) = \begin{cases} 4, & x \leq -2 \\ x^2, & -2 < x < 2 \\ 4, & x \geq 2 \end{cases}$

$$\begin{array}{r} x^2 \\ -2 \overline{) 4} \\ 0 \\ 2 \end{array}$$

$D = (-\infty, \infty)$   
 $R = [0, 4]$   
 $Z = 0$

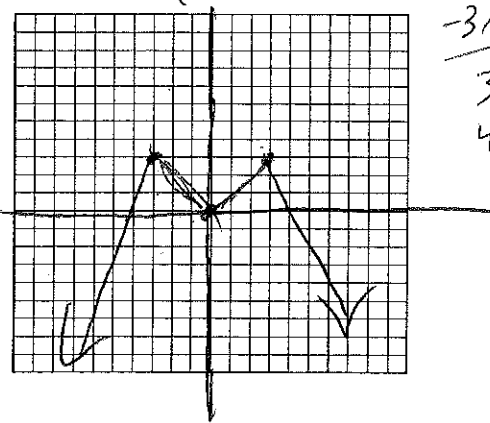


11.  $g(x) = \begin{cases} 3x+12, & x \leq -3 \\ |x|, & -3 < x < 3 \\ -3x+12, & x \geq 3 \end{cases}$

$$\begin{array}{r} 3x+12 \\ -3 \overline{) 3} \\ -4 \end{array}$$

$$\begin{array}{r} -3x+12 \\ 3 \overline{) 3} \\ 4 \end{array}$$

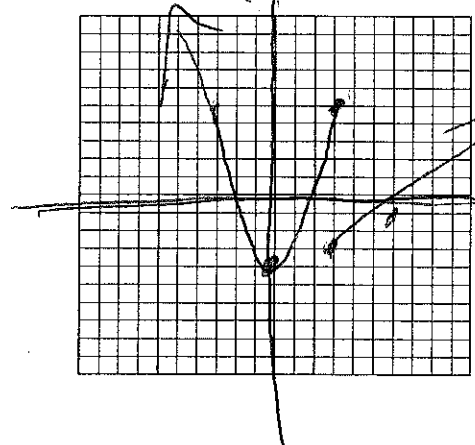
$D = -\infty, \infty$   
 $R = (-\infty, 3]$   
 $Z = 0$



12.  $h(x) = \begin{cases} x^2-4, & x < 3 \\ \frac{2}{3}x-5, & x \geq 3 \end{cases}$

$$\begin{array}{r} \frac{2}{3}x-5 \\ 3 \overline{) -3} \\ 6 \end{array}$$

$D = -\infty, \infty$   
 $R = [4, \infty)$



13. Find the domain of each function. (Interval Notation)

a)  $f(x) = \frac{x-2}{x+10} \quad (-\infty, -10) \cup (-10, \infty)$

d)  $f(x) = x^3 - 4x \quad (-\infty, \infty)$

b)  $f(x) = x^2 + 2x - 7 \quad (-\infty, \infty)$

e)  $f(x) = \frac{6}{x^2 - x - 12} \quad (-\infty, -3) \cup (3, 4) \cup (4, \infty)$

c)  $f(x) = \sqrt{8-x} + 3$   
 $8-x \geq 0$   
 $8 \geq x$   
 $[-\infty, 8]$

f)  $f(x) = 9 - \sqrt{x+5}$   
 $x+5 \geq 0$   
 $x \geq -5$   
 $[-5, \infty)$