

# Pre-Calculus – Unit 3

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Period: \_\_\_\_\_

ID: 2

## Unit 3 Corrective Assignment – Function Analysis

Pre-Calculus

Find the **domain** of the indicated function. Write your answers using inequality notation. **Classify** all discontinuities.

1.  $h(t) = \frac{\sqrt{t+49}}{t-7}$

2.  $f(x) = \frac{8+x}{64+x^2}$

3.  $g(w) = \frac{w^2 - 3w}{2w^3 + w^2 - 21w}$

Domain:	Absolute max/min value(s):	<p>4.</p>
Local extrema that are NOT absolute:		
Increasing:	Decreasing:	
Left End-behavior: $\lim_{x \rightarrow -\infty} f(x) =$	Right End-behavior: $\lim_{x \rightarrow \infty} f(x) =$	<p>5. <math>f(x) = \frac{x^2-9}{ x-3 }</math></p>
Domain:	Absolute max/min value(s):	
Local extrema that are NOT absolute:		
Increasing:	Decreasing:	
Left End-behavior: $\lim_{x \rightarrow -\infty} f(x) =$	Right End-behavior: $\lim_{x \rightarrow \infty} f(x) =$	

Find the value of the given function at the indicated domain value.

$$g(x) = \begin{cases} x^2 + 7x - 5, & x < -5 \\ 5 - x^3, & -3 \leq x < 5 \\ -\sqrt{x-9}, & x \geq 5 \end{cases}$$

$$h(x) = \begin{cases} -x^2 - 4x + 6, & x < -2 \\ \frac{2}{3}x - 5, & -2 < x < 5 \\ |x - 15| - 2, & x \geq 5 \end{cases}$$

6.  $g(-4) =$

7.  $g(5) =$

8.  $h(10) =$

9.  $h(-2) =$

10.  $h(5) =$

11.  $h(3) =$

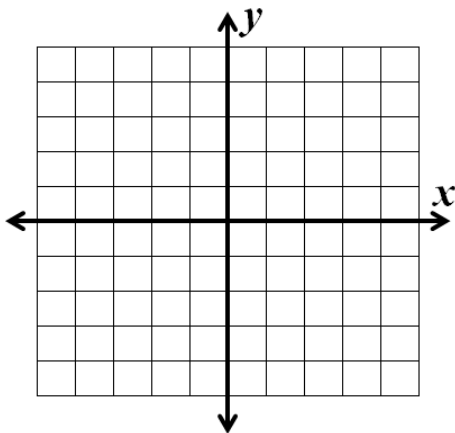
12.  $g(9) =$

13.  $h(-3) =$

Graph the following piecewise functions.

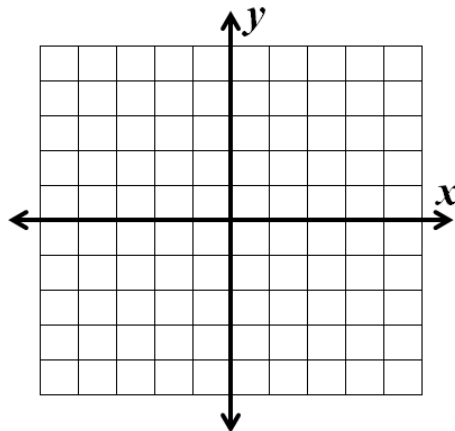
14.  $f(x) =$

$$\begin{cases} -\frac{1}{3}x - 2, & x < -3 \\ 2, & -3 \leq x \leq 2 \\ x - 5, & x > 2 \end{cases}$$



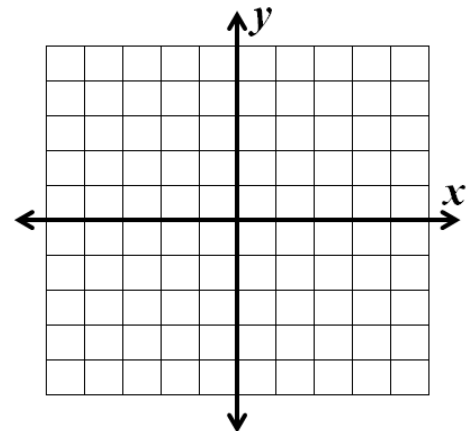
15.  $g(x) =$

$$\begin{cases} -3, & -4 \leq x < -3 \\ 1, & -3 < x \leq 0 \\ -|x - 2|, & x > 0 \end{cases}$$



16.  $h(x) =$

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



**Skillz Review:** Solve or evaluate.

17.  $\sqrt{-245}$

18.  $7x^2 + 8 = 358$

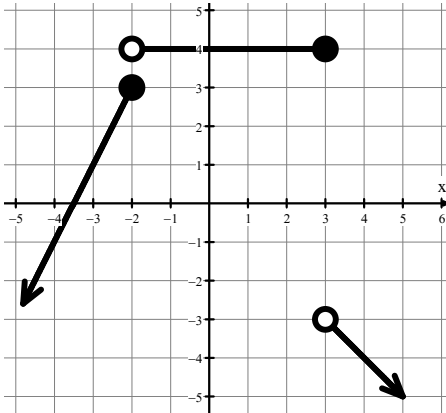
19.  $-3(x + 2)^2 - 1 = -49$

20.  $2(x + 6)^2 = -68$

Given the graph of  $f$ , write out the function's equation. Use a linear expression ( $mx + b$ ) for straight lines, absolute values if there is a "V" graph.

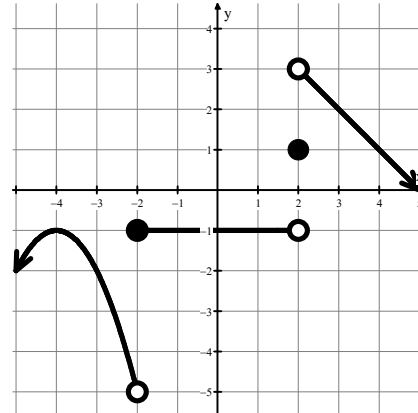
21.

$$f(x) =$$



22.

$$f(x) =$$



23. Is this function continuous? (SHOW WORK!)

$$f(x) = \begin{cases} 20 - 3x, & x < 8 \\ -\sqrt{x - 4}, & x \geq 8 \end{cases}$$

24. What value(s) of  $k$  would make the function continuous?

$$h(x) = \begin{cases} \sqrt{13 - x}, & x \leq -87 \\ k^2 - 3k, & x > -87 \end{cases}$$

25. Mr. Kelly wants to create a rectangular feeding pen for his chickens, but only has 70 meters of fencing. He decides to use the side of his house as one side of the pen.

a. If  $x$  represents the width of the pen, express its area  $A$  in terms of  $x$ . (The side of Kelly's house is the length.)

b. What is the domain of the function  $A$  (determined by the physical restrictions)?

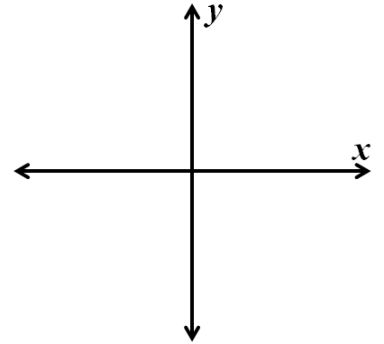
26. Rewrite the function  $f(x) = \frac{1}{3}|x - 15| - 8$  as a piecewise function.

27. A rectangle has its base on the  $x$ -axis and its two upper corners on the parabola  $y = 4 - x^2$ .

a. Draw this scenario on the coordinate plane to the right, and draw one possible rectangle.

b. Label the base and height of your rectangle in terms of  $x$ .

c. Find the function  $A(x)$  that represents the area of the rectangle.



d. What is the largest possible area of this rectangle?

e. At what  $x$ -value should the rectangle be drawn for the largest area?

---

28. Kelly is headed off to Hickville, New York and is renting a car to get there from Sully's house in O-high-O. He needs to rent a car to get there and finds one car rental agency that charges \$0.21 per mile if the total mileage does not exceed 75. If the total mileage exceeds 75, the agency charges \$0.21 per mile for the first 75 miles and only \$0.16 per mile for each mile over 75. If  $m$  represents the number of miles a rented vehicle is driven, express the mileage charge  $C(m)$  as a function of  $m$ . Find  $C(24)$  and  $C(205)$ .

$$C(m) = \left\{ \right.$$

$$C(24) =$$

$$C(205) =$$