

Unit 2 REVIEW – Functions and Limits

Pre-Calculus

1) Do the following pairs of input and output values represent a function: $(-10, 1)$, $(4, 0)$, $(0, 1)$, $(3, -2)$, and $(4, 3)$? If they don't, give a specific reason why not.

2) The hours you stay awake is a function of the number of Monster drinks you have in the evening. Identify the independent and dependent variables.

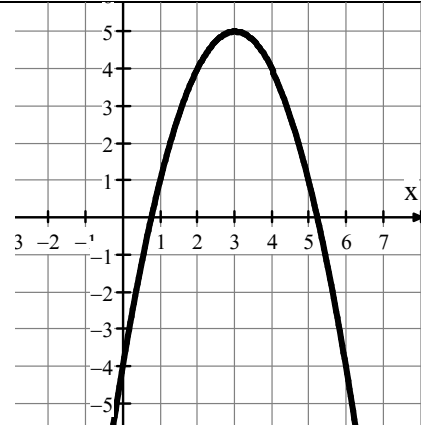
3) Use the graph to the right to approximate the following values to the nearest tenth.

a. $f(5) =$

b. $f(0) =$

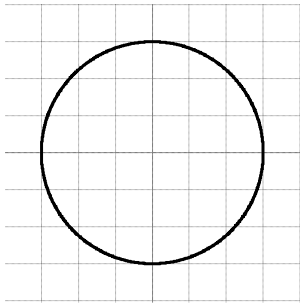
c. If $f(x) = 5$, then $x =$

d. If $f(x) = 0$, then the possible value(s) of x are:



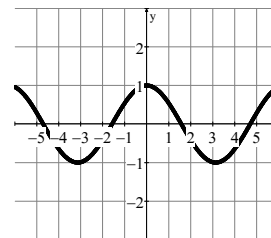
4) If the dependent variable is the number of kilometers you can drive, and the independent variable is the amount of gas (measured in liters) in your car, write a sentence explaining the meaning of $k(20) = 285$.

5) Tell if the graph below represents a function.



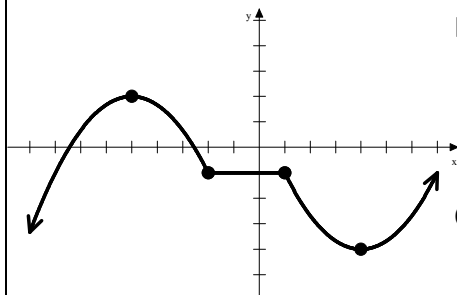
6) Name the basic function shown and write the equation.

Function



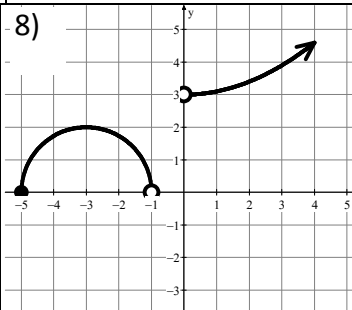
$f(x) =$

7) Identify the domain intervals where each function is increasing, decreasing, and constant. Use interval notation.



Inc: _____ Dec: _____

Constant: _____



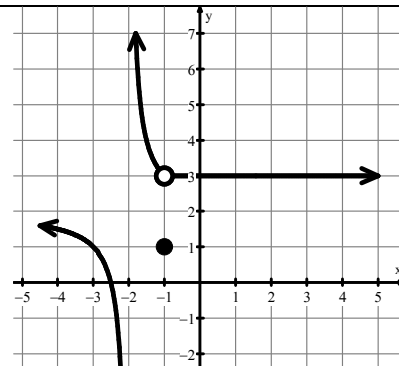
Domain:
Interval: _____

Inequality: _____

Range:
Interval: _____

Inequality: _____

9) Identify the x -values of each discontinuity, and write if it is removable or not. If it is nonremovable then classify the type.



10) Give the value of each statement.

a. $\lim_{x \rightarrow -1^-} f(x) =$

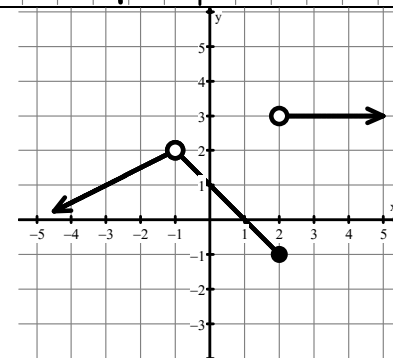
b. $f(2) =$

c. $\lim_{x \rightarrow 1^+} f(x) =$

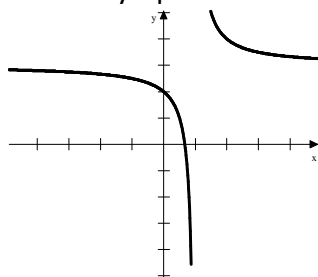
d. $\lim_{x \rightarrow 2^+} f(x) =$

e. $f(-1) =$

f. $\lim_{x \rightarrow 2} f(x) =$



11) Use limit notation to represent the horizontal and vertical asymptotes.



Horizontal Asymptote:

Vertical Asymptote:

12) $G(h)$ represents your numerical grade in precalculus based on the number of hours h you study per day outside of school. Give a relevant domain and range for this function using inequality notation.

13) $f(x) = \frac{2x-3}{x+1}$ has a vertical asymptote at $x = -1$. Create a table of values to determine the behavior of the graph at the vertical asymptote, then use limit notation to explain the behavior. Also, use a graphing calculator to determine the horizontal asymptote.

14) Sketch (freehand) a graph of a function f that satisfies all of the following conditions:

a. $\lim_{x \rightarrow 2} f(x) = -3$

b. $\lim_{x \rightarrow -3^-} f(x) = f(2) = 5$

c. f is increasing on $(-\infty, -3)$

d. $\lim_{x \rightarrow -3^-} f(x) > \lim_{x \rightarrow -3^+} f(x)$

e. f is constant on $(2, \infty)$

