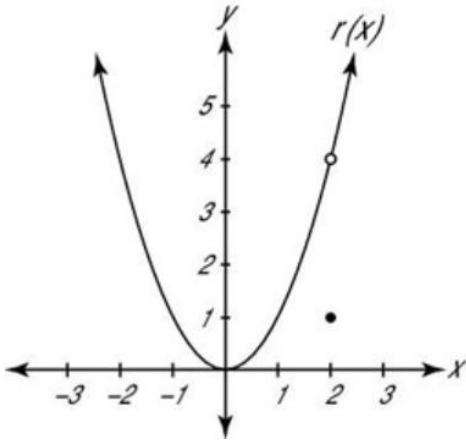


Definition: **The Limit** is the y-value that a function or graph approaches as the x-value moves closer to a given constant

Function Value is finding the location of the y-value of the graph at a specific x-value.

Example 1:



* The y-value of the graph when $x=2$ is 1"

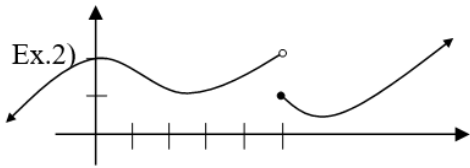
Notation:

* "The Limit of $r(x)$ as x approaches 2 is 4 "

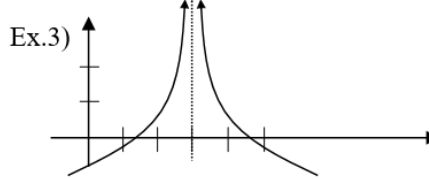
Notation:

*In order for a limit to exist, the graph **MUST** approach the same **Real Number** y-value from both sides of the target x-value constant.

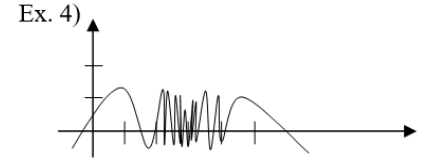
Examples where the Limit does not exist:



*Jump discontinuity



*Vertical Asymptote



*Graphs with oscillating behavior

Example 2:

$$\lim_{x \rightarrow 5} f(x) =$$

Example 3: $\lim_{x \rightarrow 3} f(x) =$

Example 4: $\lim_{x \rightarrow 3} \sin\left(\frac{1}{x}\right) =$

Example 5: Find the limit using a table of values given that $f(x) = \frac{x^3-1}{x-1}$

x	0.9	.99	.999	1	1.0001	1.001	1.01	1.1
f(x)	2.71	2.97	2.997	Undefined	3.0003	3.003	3.03	3.31

$$\lim_{x \rightarrow 1} \frac{x^3 - 1}{x - 1} =$$

1) $\lim_{x \rightarrow -5} f(x) =$

2) $\lim_{x \rightarrow -4} f(x) =$

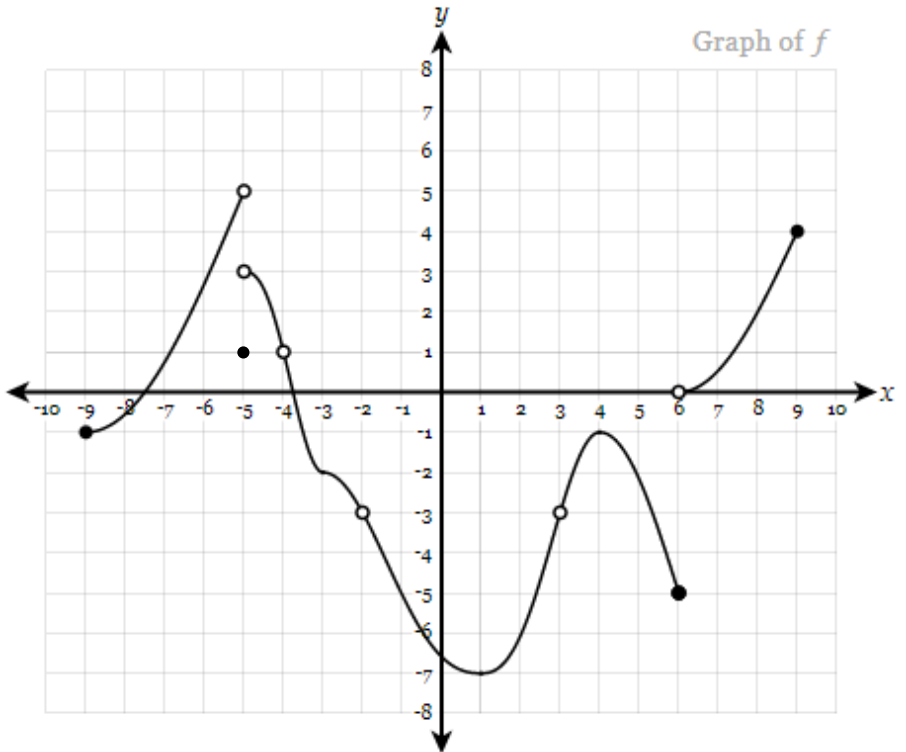
3) $f(-3) =$

4) $\lim_{x \rightarrow -3} f(x) =$

5) $f(3) =$

6) $\lim_{x \rightarrow 3} f(x) =$

7) $\lim_{x \rightarrow 6} f(x) =$



8) $\lim_{x \rightarrow -8} f(x) =$

9) $\lim_{x \rightarrow -7} f(x) =$

10) $f(-3) =$

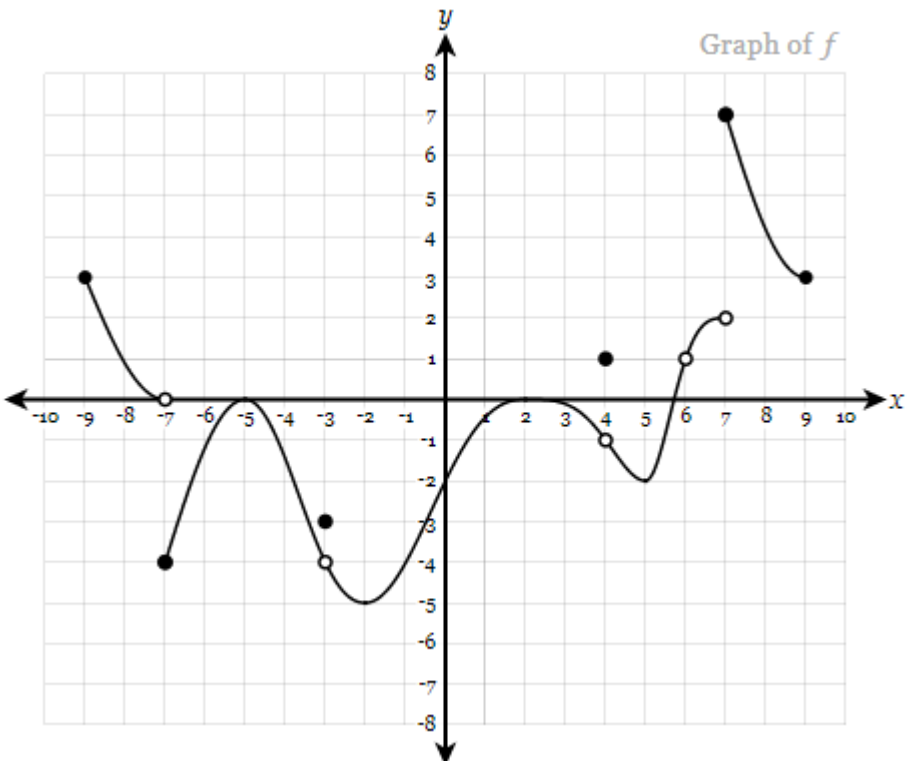
11) $\lim_{x \rightarrow 4} f(x) =$

12) $f(4) =$

13) $f(6) =$

14) $\lim_{x \rightarrow 6} f(x) =$

15) $\lim_{x \rightarrow 7} f(x) =$



Ch. 1.2 WS #1 Continued

16) $\lim_{x \rightarrow -9} f(x) =$

17) $\lim_{x \rightarrow -6} f(x) =$

18) $\lim_{x \rightarrow -4} f(x) =$

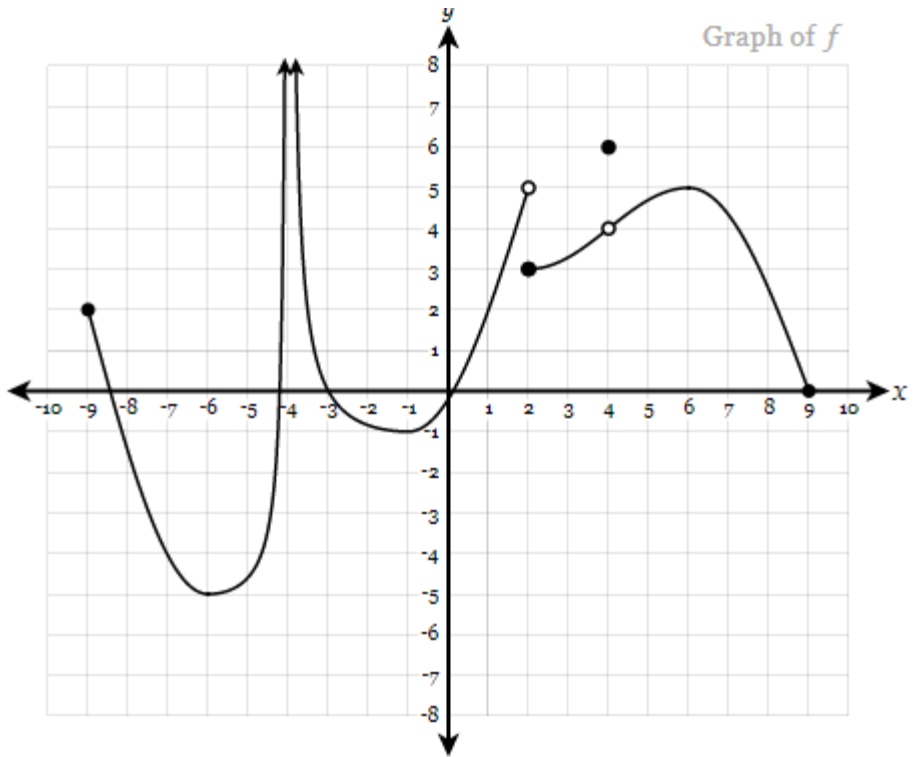
19) $f(-4) =$

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

21) $f(2) =$

22) $\lim_{x \rightarrow 4} f(x) =$

23) $f(4) =$



24) $\lim_{x \rightarrow -6} f(x) =$

25) $\lim_{x \rightarrow -4} f(x) =$

26) $f(-4) =$

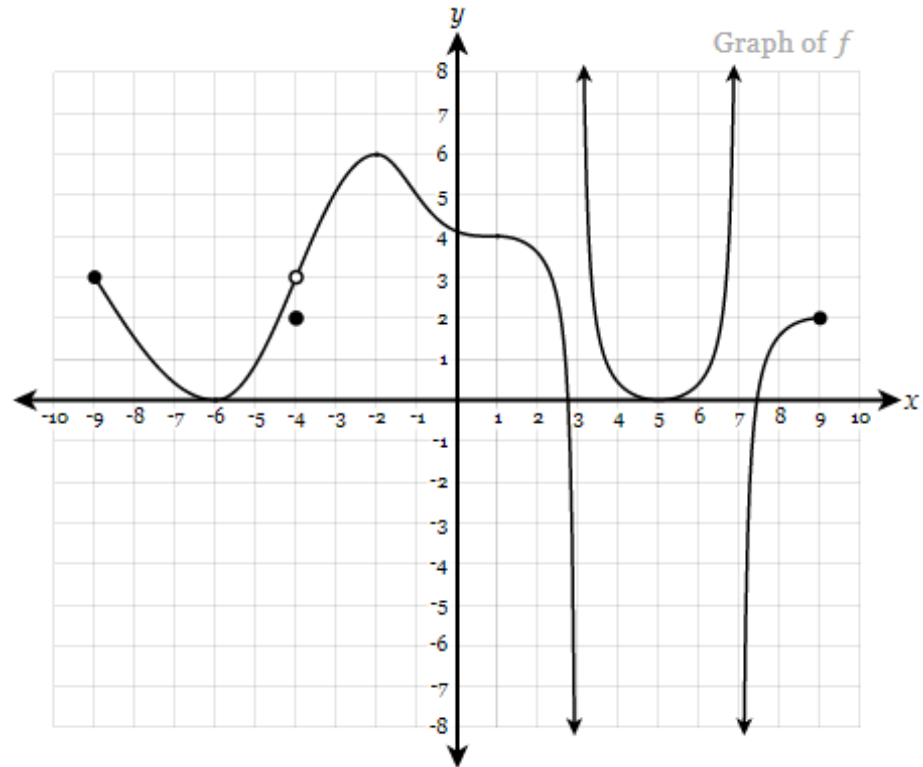
27) $f(3) =$

28) $\lim_{x \rightarrow 3} f(x) =$

29) $\lim_{x \rightarrow 5} f(x) =$

30) $\lim_{x \rightarrow 7} f(x) =$

31) $\lim_{x \rightarrow 9} f(x) =$



Calculus Ch. 1.2 Classwork Problems Worksheet #2

Sketch graph of a function satisfying the given descriptions:

1) $\lim_{x \rightarrow -5} f(x) = 3$

2) $f(-5) = -2$

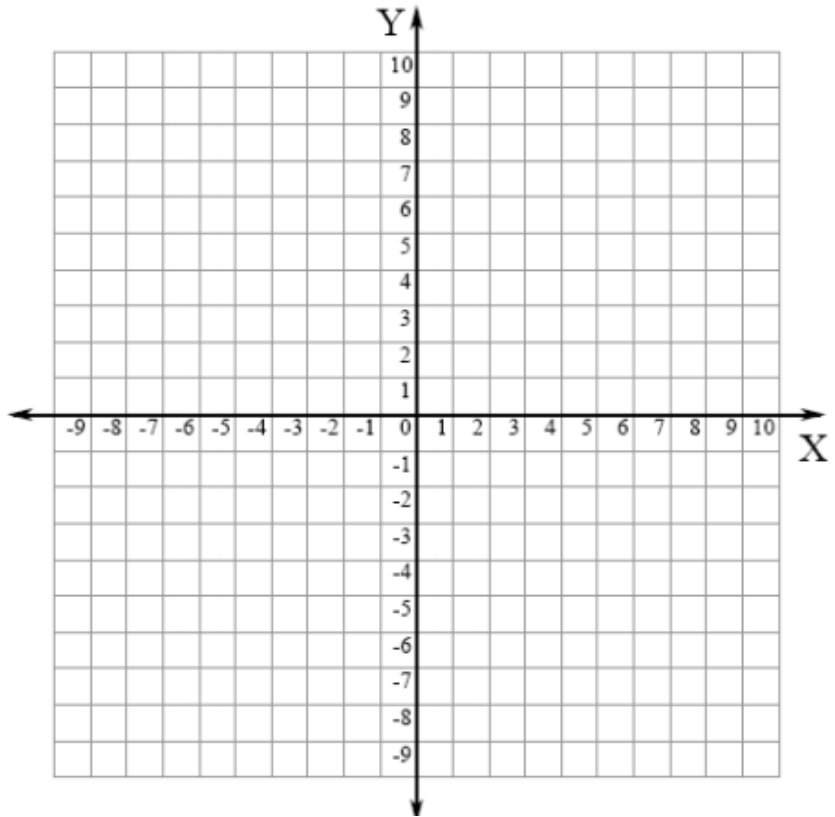
3) $f(-1) = 6$

4) $\lim_{x \rightarrow -3} f(x) = -\infty$

5) $f(3) = \text{undefined}$

6) $\lim_{x \rightarrow 3} f(x)$ does not exist

7) $\lim_{x \rightarrow 6} f(x) = 4$



8) $\lim_{x \rightarrow -8} f(x) = DNE$

9) $\lim_{x \rightarrow -7} f(x) = -5$

10) $f(-3) = 5$

11) $\lim_{x \rightarrow 4} f(x) = 2$

12) $f(4) = \text{undefined}$

13) $f(6) = 4$

14) $\lim_{x \rightarrow 6} f(x) = \infty$

15) $\lim_{x \rightarrow 7} f(x) = -3$

