Analysis CP Practice Limits Test Name_____Date_____Period_____

For figure 1:

1. a. Find $\lim_{n\to 2^-} f(x)$ _____

b. Find $\lim_{n\to 2^+} f(x)$ _____

c. Find $\lim_{n\to 2} f(x)$ _____

d. Find f(2)_____

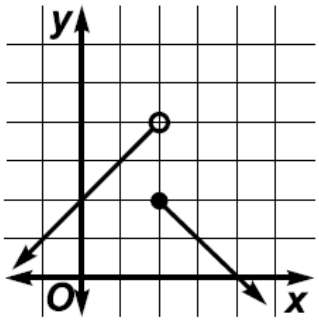


Figure 1A

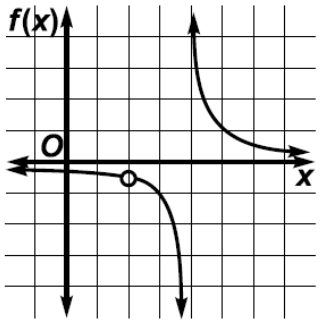


Figure 1B

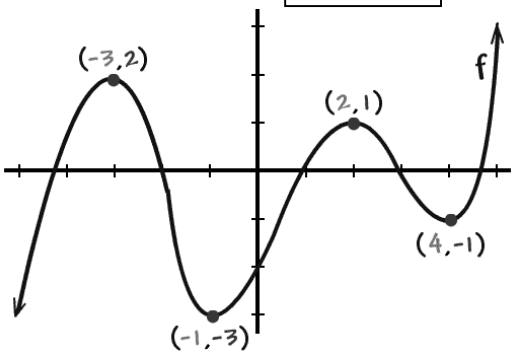
2. Identify the location(s) and type(s) of discontinuities.

Figure 1A:_____

Figure 1B:_____

Figure 1B:_____

Figure 2



3. For Figure 2, determine the interval(s) on which the function is:

Increasing: _____

Decreasing: _____

4. Describe the end behavior of the following functions:

$-7x^8 - 2x + 1$ _____

$7x^8 - 2x + 1$ _____

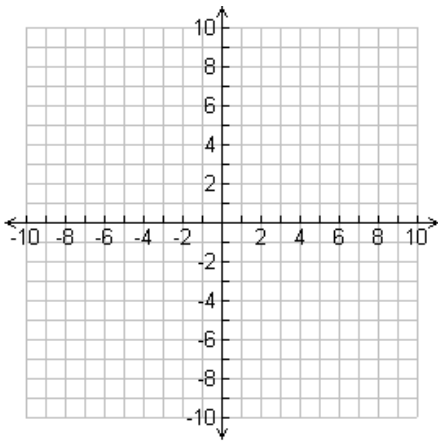
$-7x^9 - 2x + 1$ _____

$7x^9 - 2x + 1$ _____

5. Describe the three steps needed to prove algebraically that a function is continuous at a given point.

6. Use the graph on the right to graph the following piece-wise function:

$$\begin{cases} -x^2 + 3 \; if \; x > -2 \\ 3x - 5 \; if \; x \leq -2 \end{cases}$$



7. Show algebraically that $f(x) = \frac{5x-1}{3}$ is continuous at x = 3.

8. Find the following limits algebraically.

a. $\lim_{x \to 4} -3x^3 + 8.$

b. $\lim_{n \to 2} \frac{x^2-4}{x-2}$

c. $\lim_{n \to \infty} \frac{-n^7+7n^5+5}{n^7-7n^5+1}$

d. $\lim_{n \to \infty} \frac{-4n^3+n^2-1}{n^2}$

e. $\lim_{x \to \infty} \frac{x+3}{x^2-4}$

Bonus: Is there an easier way to find limits to infinity? Hint: Think about the exponents in the numerator versus denominator).