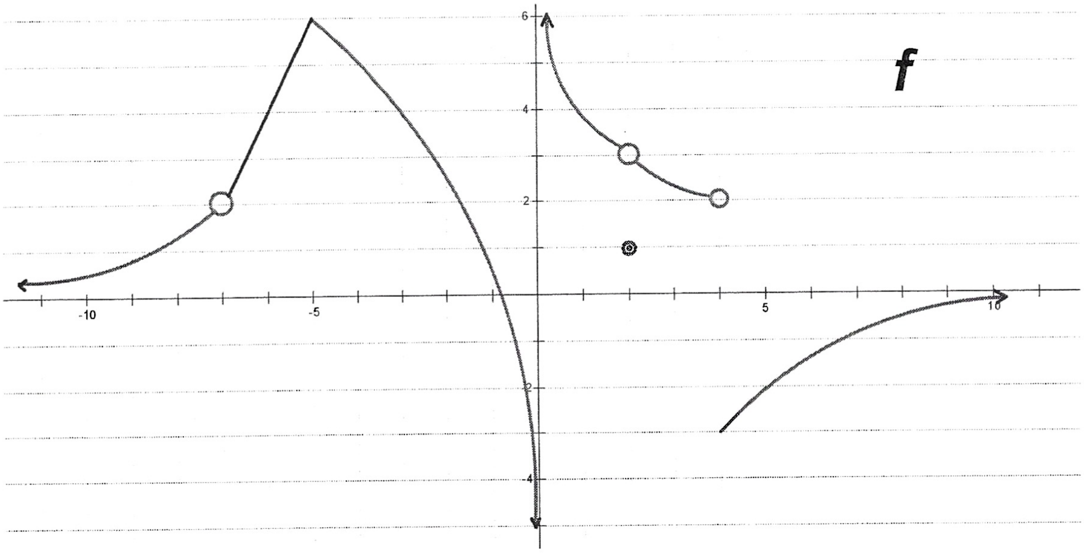
Limits and Continuous Functions

Name:____________________________________

Period:________________Date:___________________

I. The graph of a function f is shown below.



Answer the following questions about function f.

1. $f(-5) =$

2. $f(2) =$

3. $f(4) =$

4. $\lim_{x \to -7} f(x) =$

5. $\lim_{x \to -5} f(x) =$

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

7. $\lim_{x \to 4} f(x) =$

8. $\lim_{x \to 0} f(x) =$

9. $\lim_{x \to 0^-} f(x) =$

10. $\lim_{x \to 0^+} f(x) =$

11. $\lim_{x \to 4^+} f(x) =$

12. $\lim_{x \to 4^-} f(x) =$

13. $\lim_{x \to -\infty} f(x) =$

14. $\lim_{x \to \infty} f(x) =$

15. Use the definition of a continuous function at a number to answer the following.

a. f is not continuous at x = -7 because:____

b. f is not continuous at x = 2 because:____

c. f is not continuous at x = 4 because:____

II. For the following problems, sketch a graph of a function that has the indicated features and write an equation for the function that has these features. The function may be a piecewise.

1. The function is continuous at x = 3, but has a cusp there.	2. The function has a limit as x approaches 3 but fails to be continuous there because f(3) is undefined.
3. The function has a limit as x approaches -1, has a value for f(-1), but still is not continuous there.	4. The function has no limit as x approaches 0, but f(0)=3.
5. The function has a limit of 2 as x approaches 0 from the right, but has no limit as x approaches 0 from the left.	6. The function has a step (or jump) discontinuity at x = 1, and f(1) = 6.
7. The function has a limit as x approaches 2 of 5 but f(2) = 4.	8. The function has a right-hand limit of -2 and a left-hand limit of 2 as x approaches -1.