

Calculus H
Ch. 2 #5

Name _____

Using the figure at right. Find the following.

1. $\lim_{x \rightarrow 1} f(x) =$ _____ 2. $\lim_{x \rightarrow 2} f(x) =$ _____

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

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

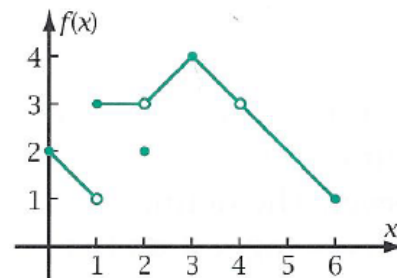
6. Is f continuous at $x = 1$? _____

7. Is f continuous at $x = 2$? _____

8. Is f continuous at $x = 3$? _____

9. Is f continuous at $x = 4$? _____

10. Is f continuous at $x = 5$? _____



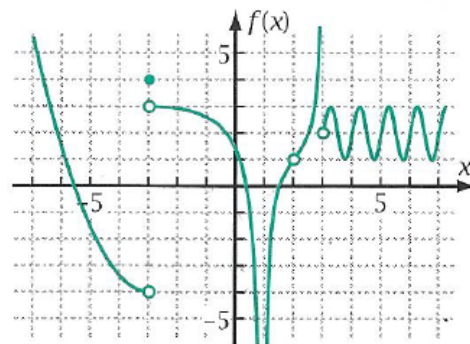
For piecewise function f , what do the following limits appear to be?

11. $\lim_{x \rightarrow -\infty} f(x) =$ _____ 12. $\lim_{x \rightarrow -3^-} f(x) =$ _____

13. $\lim_{x \rightarrow -3^+} f(x) =$ _____ 14. $\lim_{x \rightarrow 1} f(x) =$ _____

15. $\lim_{x \rightarrow 2} f(x) =$ _____ 16. $\lim_{x \rightarrow 3^-} f(x) =$ _____

17. $\lim_{x \rightarrow 3^+} f(x) =$ _____ 17. $\lim_{x \rightarrow \infty} f(x) =$ _____



For #18 – 21, sketch the graph of a function that has the given features.

18. $\lim_{x \rightarrow 2^-} f(x) = \infty$ and $\lim_{x \rightarrow 2^+} f(x) = \infty$

19. $\lim_{x \rightarrow 2^-} f(x) = \infty$ and $\lim_{x \rightarrow 2^+} f(x) = -\infty$

20. $\lim_{x \rightarrow \infty} f(x) = 5$ and $\lim_{x \rightarrow -\infty} f(x) = 7$

21. $\lim_{x \rightarrow \infty} f(x) = \infty$ and $\lim_{x \rightarrow -\infty} f(x) = \infty$

Determine whether the function has a vertical asymptote or a removable discontinuity at $x = -1$. Graph the function using your graphing calculator to confirm your answer.

22. $f(x) = \frac{x^2 - 1}{x + 1}$

23. $f(x) = \frac{x^2 - 6x - 7}{x + 1}$

24. $f(x) = \frac{x^2 + 1}{x + 1}$

25. $f(x) = \frac{\sin(x + 1)}{x + 1}$

26. Wanda Wye wonders why the form $\frac{1}{0}$ is infinite and why the form $\frac{1}{\infty}$ is zero. Explain to her what happens to the size of the fractions such as $\frac{1}{0.1}$, $\frac{1}{0.0001}$, and so on, as the denominator gets close to zero. Explain what happens as the denominator becomes very large.