1A Exercises

Finding Limits Graphically & Numerically

Complete the table and use the result to estimate the limit. Use a graphing utility to graph the function to confirm your result. Sketch the graph in the neighborhood of the limit point.

1. $\lim\limits_{x \to 4} \dfrac{x - 4}{x^2 - 3x - 4}$

x	3.9	3.99	3.999	4.001	4.01	4.1
$f(x)$						

5. $\lim\limits_{x \to 3} \dfrac{[1/(x + 1)] - (1/4)}{x - 3}$

x	2.9	2.99	2.999	3.001	3.01	3.1
$f(x)$						

7. $\lim\limits_{x \to 0} \dfrac{\sin x}{x}$

x	-0.1	-0.01	-0.001	0.001	0.01	0.1
$f(x)$						

8. $\lim\limits_{x \to 0} \dfrac{\cos x - 1}{x}$

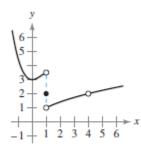| x	-0.1	-0.01	-0.001	0.001	0.01	0.1
$f(x)$						

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In Exercises 25 and 26, use the graph of the function f to decide whether the value of the given qantity exists. If it does, find it. If not, explain why.

25. (a) $f(1)$

 (b) $\lim\limits_{x \to 1} f(x)$

 (c) $f(4)$

 (d) $\lim\limits_{x \to 4} f(x)$

26. (a) $f(-2)$

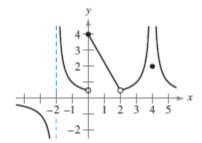 (b) $\lim\limits_{x \to -2} f(x)$

 (c) $f(0)$

 (d) $\lim\limits_{x \to 0} f(x)$

 (e) $f(2)$

 (f) $\lim\limits_{x \to 2} f(x)$

 (g) $f(4)$

 (h) $\lim\limits_{x \to 4} f(x)$

In Exercises 31 and 32, sketch a graph of a function f that satisfies the given values. (There are many correct answers)

31. $f(0)$ is undefined.

 $\lim\limits_{x \to 0} f(x) = 4$

 $f(2) = 6$

 $\lim\limits_{x \to 2} f(x) = 3$

32. $f(-2) = 0$

 $f(2) = 0$

 $\lim\limits_{x \to -2} f(x) = 0$

 $\lim\limits_{x \to 2} f(x)$ does not exist.