

# §1.2-1.3 Practice WS

Name: \_\_\_\_\_

Find the following limits analytically.

1. Given  $f(x) = x + 7$  and  $g(x) = x^2$

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

b)  $\lim_{x \rightarrow 4} g(x) =$

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

2. Given  $f(x) = -2x + 5$  and  $g(x) = \sqrt{x}$ , find the following limit.

$$\lim_{x \rightarrow -10} g(f(x))$$

3.  $\lim_{x \rightarrow 0} \frac{\sqrt{2+x} - \sqrt{2}}{x}$

4.  $\lim_{x \rightarrow 1} \frac{\sqrt{3-x} + \sqrt{3}}{x-1}$

5.  $\lim_{x \rightarrow 0} \frac{1 - \cos x}{x}$

6.  $\lim_{x \rightarrow 0} \frac{\sin x}{x} =$

7.  $\lim_{x \rightarrow 0} \frac{(\sin x)(x+2)}{x} =$

8.  $\lim_{x \rightarrow 0} \frac{5 - 5 \cos x}{3x} =$

9.  $\lim_{x \rightarrow 0} \frac{\tan x}{4x}$

10.  $\lim_{x \rightarrow 2} \frac{x^2 + x - 6}{x^2 - 4}$

11.  $\lim_{x \rightarrow 2} \frac{\frac{1}{x} - \frac{1}{2}}{x - 2}$

12.  $\lim_{x \rightarrow 0} \frac{(x-5)^2 - 25}{x}$

Use the graph of  $f(x)$  to evaluate the following, if possible.

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

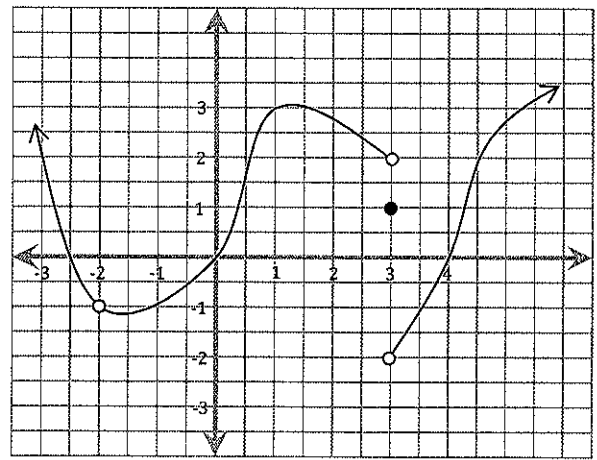
14.  $\lim_{x \rightarrow 3^+} f(x) =$

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

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

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

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



17.  $f(3) =$

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

21.  $f(-2) =$

Sketch the graph of the function and answer the following questions.

22.  $f(x) = \begin{cases} 2 - x, & x < -1 \\ x, & -1 \leq x < 1 \\ 4, & x = 1 \\ 4 - x, & x > 1 \end{cases}$

23.  $\lim_{x \rightarrow -1^-} f(x) =$

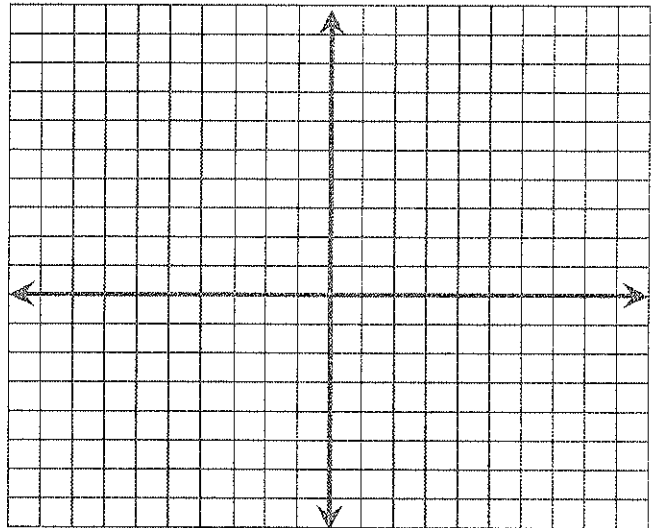
24.  $\lim_{x \rightarrow -1^+} f(x) =$

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

26.  $\lim_{x \rightarrow 1^+} f(x) =$

27.  $\lim_{x \rightarrow 1^-} f(x) =$

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



On a separate sheet of paper, sketch a graph of a function with the following properties.

29.  $f(x)$  given:  
 $f(-1) = 2$   
 $f(0) = -1$   
 $f(1) = 3$   
 $\lim_{x \rightarrow 1} f(x)$  does not exist

30.  $f(x)$  given:  
 $f(x) = 1$ , for  $-2 \leq x \leq 1$   
 $\lim_{x \rightarrow 1^+} f(x) = 3$   
 $\lim_{x \rightarrow -2} f(x) = 1$

31.  $f(x)$  given:  
 $f(0) = 1$   
 $\lim_{x \rightarrow 0^-} f(x) = 2$   
 $\lim_{x \rightarrow 0^+} f(x) = 3$

32.  $f(x)$  given:  
 $\lim_{x \rightarrow 0} f(x) = -2$   
 $f(0) = 1$   
 $f(2) = 3$   
 $\lim_{x \rightarrow 2} f(x)$  does not exist