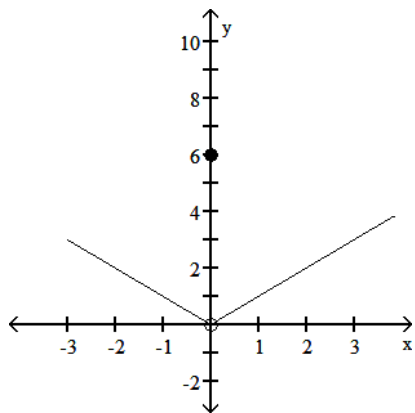


Use the graph to evaluate the indicated limit and function value or state that it does not exist.

- 1) Find  $\lim_{x \rightarrow 0^+} f(x)$  \_\_\_\_\_ Find  $\lim_{x \rightarrow 0^-} f(x)$  \_\_\_\_\_  $\lim_{x \rightarrow 0} f(x)$  \_\_\_\_\_  $f(0)$  \_\_\_\_\_.



Find the limit.

- 2)  $\lim_{x \rightarrow 2} (x^2 + 8x - 2)$  \_\_\_\_\_ 2) \_\_\_\_\_  
 A) does not exist      B) 0      C) -18      D) 18

Find the limit, if it exists.

- 3) Find:  $\lim_{x \rightarrow -4} \frac{x^2 - 16}{x + 4}$
- 4) Find:  $\lim_{x \rightarrow 3} \frac{x - 3}{x^2 - 3x}$  \_\_\_\_\_ 4) \_\_\_\_\_  
 A)  $-\frac{1}{3}$       B) 0      C) DNE      D)  $\frac{1}{3}$

5) Let  $f(x) = \begin{cases} \frac{x^2 - 16}{x + 4} & \text{if } x > 0 \\ \frac{x^2 - 16}{x - 4} & \text{if } x < 0 \end{cases}$

Find  $\lim_{x \rightarrow 0^+} f(x)$ .

6) Evaluate the following limit.

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

7) Evaluate the following limit

7) \_\_\_\_\_

$$\lim_{x \rightarrow 2^-} \frac{1}{x-2}$$

- A) 2                                      B) DNE                                      C)  $\infty$                                       D)  $-\infty$

Solve the problem.

8) A company training program determines that, on average, a new employee can do  $P(x)$  pieces of work per day after  $s$  days of on-the-job training, where  $P(x) = \frac{90 + 60x}{x + 5}$ . Find  $\lim_{x \rightarrow 5} P(x)$ .

8) \_\_\_\_\_

- A) 30                                      B) 105                                      C) 42                                      D) Does not exist

9) The cost of manufacturing a particular videotape is  $C(x) = 9000 + 9x$ , where  $x$  is the number of tapes produced. The average cost per tape, denoted by  $\bar{C}(x)$ , is found by dividing  $C(x)$  by  $x$ . Find

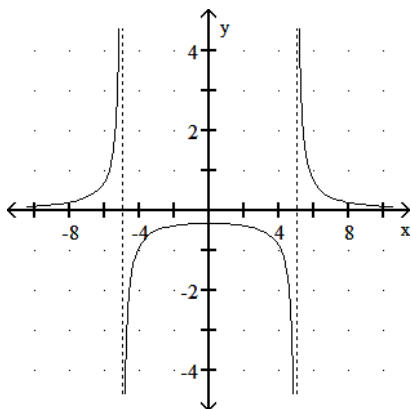
9) \_\_\_\_\_

$$\lim_{x \rightarrow 9000} \bar{C}(x).$$

- A) 6                                      B) 14                                      C) 10                                      D) Does not exist

Use the given graph to find the indicated limit.

10)



$$\lim_{x \rightarrow 5^+} f(x)$$

$$\text{Discuss: } \lim_{x \rightarrow -5^+} f(x)$$

Find the limit.

11)  $\lim_{x \rightarrow \infty} \frac{x^2 + 5x + 17}{x^3 + 3x^2 + 18}$

11) \_\_\_\_\_

- A)  $\frac{17}{18}$                                       B) 1                                      C) 0                                      D)  $\infty$

12)  $\lim_{x \rightarrow -\infty} \frac{-3 + (2/x)}{5 - (1/x^2)}$

12) \_\_\_\_\_

- A)  $-\infty$                                       B)  $-\frac{3}{5}$                                       C)  $\frac{3}{5}$                                       D)  $\infty$

13)  $\lim_{x \rightarrow \infty} \frac{7x^3 - 6x^2 + 3x}{-x^3 - 2x + 7}$  13) \_\_\_\_\_

A)  $\frac{3}{2}$                       B)  $\infty$                       C)  $-7$                       D)  $7$

14)  $\lim_{x \rightarrow \infty} \frac{2x + 1}{12x - 7}$  14) \_\_\_\_\_

A)  $0$                       B)  $\frac{1}{6}$                       C)  $-\frac{1}{7}$                       D)  $\infty$

Provide an appropriate response.

15) Find the vertical asymptote(s) of the graph of the given function. 15) \_\_\_\_\_

$f(x) = \frac{x^2 - 100}{(x - 9)(x + 3)}$

A)  $y = 9, y = -3$                       B)  $x = 9, x = -3$                       C)  $x = -9$                       D)  $x = 10, x = -10$

16) Find the horizontal asymptote, if any, of the given function.

$f(x) = \frac{2x^3 - 3x - 9}{9x^3 - 5x + 3}$

17) Find the horizontal asymptote, if any, of the given function. 17) \_\_\_\_\_

$f(x) = \frac{(x - 3)(x + 4)}{x^2 - 4}$

A)  $y = 1$                       B)  $x = 2, x = -2$                       C)  $y = 3, y = -4$                       D) None

18) Determine where the function  $H(x) = \frac{x^2 + 7}{x^2 + x - 6}$  is continuous. 18) \_\_\_\_\_

A)  $(-\infty, -3) \cup (-3, 2)$                       B)  $(-\infty, -3) \cup (-3, 2) \cup (2, \infty)$

C)  $(-\infty, -3)$                       D)  $(-3, 2) \cup (2, \infty)$

Find average rate of change for the function over the given interval.

19) Find the average rate of change for  $f(x) = \sqrt{2x}$  if  $x$  changes from 2 to 8. 19) \_\_\_\_\_

A)  $2$                       B)  $7$                       C)  $-\frac{3}{10}$                       D)  $\frac{1}{3}$

Find the instantaneous rate of change for the function at the value given.

20) Find the instantaneous rate of change for the function  $f(x) = 5x^2 + x$  at  $x = -4$ . 20) \_\_\_\_\_

A)  $-41$                       B)  $-39$                       C)  $6$                       D)  $-14$

Solve the problem.

21) If an object moves along a line so that it is at  $y = f(x) = 3x^2 - 2x + 5$  at time  $x$  (in seconds), find the instantaneous velocity function  $v = f'(x)$ . 21) \_\_\_\_\_

A)  $3x - 2$                       B)  $3x^2 - 2$                       C)  $6x - 2$                       D)  $6x^2 - 2$

Provide an appropriate response.

22) Find  $f'(x)$  if  $f(x) = 3x^4 + 6x^7$ .

A)  $4x^3 + 7x^6$

B)  $7x^3 + 13x^6$

C)  $12x^3 + 42x^6$

D)  $3x^5 + 7x^8$

22) \_\_\_\_\_

23) Find  $f'(x)$  if  $f(x) = 6x^{-2} + 8x^3 + 11x$ .

A)  $f'(x) = -12x^{-1} + 24x^2 + 11$

B)  $f'(x) = -12x^{-3} + 24x^2 + 11$

C)  $f(x) = -12x^{-1} + 24x^2$

D)  $f'(x) = -12x^{-3} + 24x^2$

23) \_\_\_\_\_

24) Suppose that the total profit in hundreds of dollars from selling  $x$  items is given by  $P(x) = 4x^2 - 5x + 10$ . Find the marginal profit at  $x = 5$ .

A) \$45

B) \$32

C) \$15

D) \$35

24) \_\_\_\_\_

25) Let  $C(x)$  be the cost function and  $R(x)$  the revenue function. Compute the marginal cost, marginal revenue, and the marginal profit functions.

$C(x) = 0.0005x^3 - 0.036x^2 + 300x + 40,000$

$R(x) = 350x$

A)  $C'(x) = 0.0015x^2 + 0.072x + 300$

$R'(x) = 350$

$P'(x) = 0.0015x^2 + 0.072x + 50$

B)  $C'(x) = 0.0015x^2 - 0.072x + 300$

$R'(x) = 350$

$P'(x) = 0.0015x^2 - 0.072x - 50$

C)  $C'(x) = 0.0015x^2 - 0.072x + 300$

$R'(x) = 350$

$P'(x) = -0.0015x^2 + 0.072x + 50$

25) \_\_\_\_\_

Solve the problem.

26) Suppose the demand for a certain item is given by  $D(p) = -3p^2 + 3p + 5$ , where  $p$  represents the price of the item. Find  $D'(p)$ , the rate of change of demand with respect to price.

A)  $D'(p) = -3p^2 + 3$

B)  $D'(p) = -6p + 3$

C)  $D'(p) = -3p + 3$

D)  $D'(p) = -6p^2 + 3$

26) \_\_\_\_\_

## Answer Key

Testname: REVIEW02

- 1) 0; 6
- 2) D
- 3) -8
- 4) D
- 5) 4
- 6) Does not exist
- 7) D
- 8) A
- 9) C
- 10)  $\infty$
- 11) C
- 12) B
- 13) C
- 14) B
- 15) B
- 16)  $y = \frac{2}{9}$
- 17) A
- 18) B
- 19) D
- 20) B
- 21) C
- 22) C
- 23) B
- 24) D
- 25) C
- 26) B