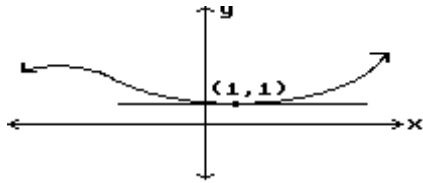


Practice TEST: PreAP Precalculus : Intro to Calculus  
NO CALCULATOR

Part I: MULTIPLE CHOICE (USE CAPITAL LETTERS)

Estimate the slope of the tangent line at the indicated point.

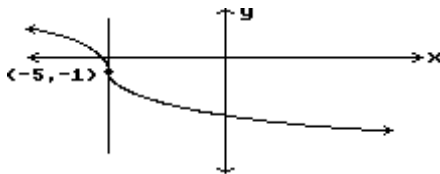
1)



- A) 1                      B) Undefined                      C) 0                      D) -1

1) \_\_\_\_\_

2)



- A) 1                      B) 0                      C) Undefined                      D) -1

2) \_\_\_\_\_

Find the derivative of the function at the specified point.

3)  $f(x) = 5x + 9$  at  $x = 2$

- A) 5                      B) 9                      C) 0                      D) 10

3) \_\_\_\_\_

4)  $f(x) = \frac{8}{x+2}$  at  $x = 0$

- A) 8                      B) -2                      C) -32                      D) 2

4) \_\_\_\_\_

5)  $g(x) = x^3 + 5x$  at  $x = 1$

- A) 3                      B) 8                      C) 6                      D) 7

5) \_\_\_\_\_

Solve the problem.

6) The position of an object at time  $t$  is given by  $s(t)$ . Find the instantaneous velocity at the indicated value of  $t$ .

$s(t) = \frac{2}{t-3}$  at  $t = 0$

- A)  $-\frac{4}{9}$                       B)  $-\frac{2}{3}$                       C)  $\frac{4}{3}$                       D)  $-\frac{2}{9}$

6) \_\_\_\_\_

Find the equation of the tangent line to the curve when  $x$  has the given value.

7)  $f(x) = 5x^2 + x$ ;  $x = -4$

- A)  $y = -39x - 80$                       B)  $y = -\frac{4x}{25} + \frac{8}{5}$                       C)  $y = \frac{x}{20} + \frac{1}{5}$                       D)  $y = 13x - 16$

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

8)  $f(x) = -5\sqrt{x}$ ;  $x = 9$  8) \_\_\_\_\_  
 A)  $y = -\frac{5}{6}x + \frac{15}{2}$       B)  $y = \frac{5}{6}x - \frac{15}{2}$       C)  $y = -\frac{5}{6}x - \frac{15}{2}$       D)  $y = -\frac{5}{6}x - 10$

Find the derivative of the function using the definition of derivative.

9)  $f(x) = \sqrt{x-3}$  9) \_\_\_\_\_  
 A)  $f'(x) = \frac{\sqrt{x-3}}{2}$       B)  $f'(x) = \frac{\sqrt{x-3}}{x-3}$   
 C)  $f'(x) = -\frac{1}{2\sqrt{x-3}}$       D)  $f'(x) = \frac{1}{2\sqrt{x-3}}$

Use a graph of the function to find the derivative of the function at the given point, if it exists.

10)  $f(x) = \begin{cases} 6+x & x \leq 4 \\ -x-9 & x > 4 \end{cases}$  at  $x = 4$  10) \_\_\_\_\_  
 A) 0      B) Does not exist      C) -1      D) 1

11)  $f(x) = \begin{cases} \frac{(x-7)(x-9)}{x-7} & x \neq 7 \\ -2 & x = 7 \end{cases}$  at  $x = 7$  11) \_\_\_\_\_  
 A) Does not exist      B) -1      C) 1      D) 0

Compute the average of the RRAM and LRAM approximations to estimate the area between the graph of the function and the x-axis over the given interval using the indicated number of subintervals. (The function is non-negative on the given interval).

12)  $f(x) = x^2 + 4$ ;  $[0, 5]$ ; 5 subintervals 12) \_\_\_\_\_  
 A)  $\frac{129}{2}$       B)  $\frac{125}{2}$       C) 67      D) 125

Find the definite integral by computing an area.

13)  $\int_3^8 3 \, dx$  13) \_\_\_\_\_  
 A) 33      B)  $\frac{15}{2}$       C) 5      D) 15

14)  $\int_1^7 (3x-2) \, dx$  14) \_\_\_\_\_  
 A) 72      B) 84      C)  $\frac{119}{2}$       D) 60

15)  $\int_0^1 (kx+1) \, dx$ ;  $k \geq 0$  15) \_\_\_\_\_  
 A)  $1k+1$       B)  $\frac{1}{2}k+1$       C)  $\frac{1}{4}k-1$       D)  $\frac{1}{4}k+1$

16)  $\int_{-4}^4 \sqrt{16 - x^2} dx$  16) \_\_\_\_\_  
 A) 16 B)  $4\pi$  C)  $16\pi$  D)  $8\pi$

Solve the problem.

17) A ball is tossed straight up from level ground. The velocity of the ball at any time  $t$  (sec) is  $v(t) = 74 - 32t$  ft/sec. Find how far the ball has traveled at its maximum height. 17) \_\_\_\_\_  
 A) 86 ft B) 77 ft C) 109 ft D) 9 ft

18) A toy rocket is launched straight up from level ground. Its velocity function is  $f(t) = 189 - 32t$  ft/sec, where  $t$  is the number of seconds after launch. At what time does the rocket reach its maximum height? 18) \_\_\_\_\_  
 A) 11.81 sec B) 6.23 sec C) 5.72 sec D) 5.91 sec

Find the limit of the function.

19)  $\lim_{x \rightarrow 0} \frac{x^3 - 6x + 8}{x - 2}$  19) \_\_\_\_\_  
 A) -4 B) 4 C) 0 D) Does not exist

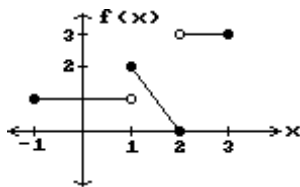
20)  $\lim_{x \rightarrow 2\pi} \ln(\cos x)$  20) \_\_\_\_\_  
 A) 1 B) 2 C) 0 D)  $\ln(2\pi)$

21)  $\lim_{x \rightarrow 1} \frac{x^4 - 1}{x - 1}$  21) \_\_\_\_\_  
 A) 0 B) 4 C) 2 D) Does not exist

22)  $\lim_{x \rightarrow 0} \frac{2 + x}{x^2}$  22) \_\_\_\_\_  
 A) 2 B) -2 C) 0 D) Does not exist

Use the given graph to determine the limit, if it exists.

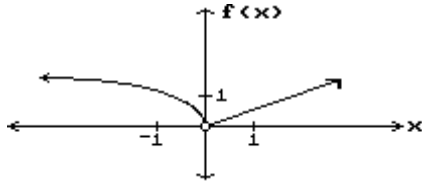
23)  $\lim_{x \rightarrow 1} f(x)$  23) \_\_\_\_\_



A) Does not exist B) 0 C) 2 D) 1

24)  $\lim_{x \rightarrow 0} f(x)$

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



A) -1

B) 1

C) Does not exist

D) 0

Find the indicated limit, if it exists.

25)  $\lim_{x \rightarrow 0} f(x), f(x) = \begin{cases} 8 - x^2 & x < 0 \\ 8 & x = 0 \\ -5x + 8 & x > 0 \end{cases}$

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

A) The limit does not exist.

B) -13

C) -5

D) 8

26)  $\lim_{x \rightarrow 5} f(x), f(x) = \begin{cases} x + 6 & x < 5 \\ 6 - x & x \geq 5 \end{cases}$

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

A) 1

B) The limit does not exist.

C) 11

D) 5

Find the limit and identify any vertical asymptotes.

27)  $\lim_{x \rightarrow 7^-} \frac{x}{x - 7}$

27) \_\_\_\_\_

A)  $-\infty$ ;  $x = -7$

B)  $-\infty$ ;  $x = 7$

C) 7; no vertical asymptotes

D)  $\infty$ ;  $x = 7$

28)  $\lim_{x \rightarrow -8} \frac{1}{x^2 - 64}$

28) \_\_\_\_\_

A) The limit does not exist; no vertical asymptotes

B) The limit does not exist;  $x = -8$  and  $x = 8$

C) 1;  $x = -8$

D) 0; no vertical asymptotes

Match the function with the correct table values.

29)  $f(x) = \frac{x - 4}{\sqrt{x} - 2}$

29) \_\_\_\_\_

x	3.9	3.99	3.999	4.001	4.01	4.1
f(x)						

A) 3.97484; 3.99750; 3.99975; 4.00025; 4.00250; 4.02485

B) 5.07736; 5.09775; 5.09978; 5.10022; 5.10225; 5.12236

C) 1.19245; 1.19925; 1.19993; 1.20007; 1.20075; 1.20745

Find the limit.

30) Let  $\lim_{x \rightarrow -2} f(x) = 225$ . Find  $\lim_{x \rightarrow -2} \sqrt{f(x)}$ .

30) \_\_\_\_\_

A) 225

B) -2

C) 3.8730

D) 15

31) Let  $\lim_{x \rightarrow 7} f(x) = -8$  and  $\lim_{x \rightarrow 7} g(x) = -2$ . Find  $\lim_{x \rightarrow 7} [f(x) + g(x)]^2$ . 31) \_\_\_\_\_

A) -6                                      B) 100                                      C) -10                                      D) 68

32) Let  $\lim_{x \rightarrow 10} f(x) = -2$  and  $\lim_{x \rightarrow 10} g(x) = 6$ . Find  $\lim_{x \rightarrow 10} \frac{-8f(x) - 2g(x)}{9 + g(x)}$ . 32) \_\_\_\_\_

A) 10                                      B)  $-\frac{2}{9}$                                       C)  $\frac{4}{15}$                                       D)  $\frac{28}{15}$

Use a finite approximation to estimate the area of the region enclosed between the graph of  $f$  and the  $x$ -axis for  $a \leq x \leq b$ .

33)  $f(x) = x^2$ ,  $a = 3$ ,  $b = 7$  33) \_\_\_\_\_  
 Use REP Rectangular approximations four rectangles of equal width.  
 A) 126                                      B) 117                                      C) 105                                      D) 86

Solve the problem.

34) A particle moves with velocity  $v(t) = 2t + 7$  find the distance traveled between  $t = 1$  and  $t = 5$ . 34) \_\_\_\_\_  
 A) 18                                      B) 26                                      C) 52                                      D) 9

Use a calculator to find the numerical integral of the function over the specified interval.

35)  $\int_0^4 x^2 e^{2x} dx$  35) \_\_\_\_\_  
 A) 18,630.74                                      B) 23,847.41                                      C) 18,630.99                                      D) 744.99