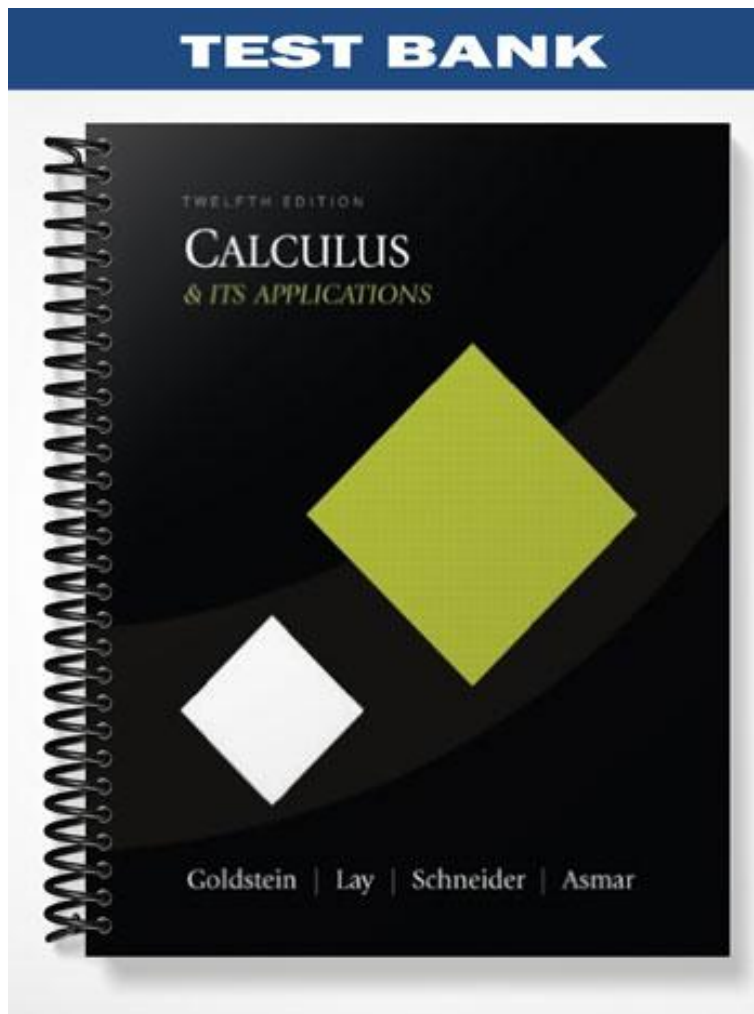


TEST BANK



TWELFTH EDITION

CALCULUS
& ITS APPLICATIONS

Goldstein | Lay | Schneider | Asmar

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 1) Find the slope of the line with equation $3y + 2 = 5x - 2y$? 1) _____
A) $\frac{1}{2}$ B) 1 C) $\frac{5}{3}$ D) 5

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

- 2) Find the slope of the line with the equation $y = 4 - 5x$. 2) _____
Enter just an integer.

- 3) Find the slope of the line with the equation $2x + 4y = 5$. 3) _____
Enter just a fraction of form $\frac{a}{b}$ in lowest terms.

- 4) Find the slope of the line with equation $2x + 4 = 2(2y + 3)$. 4) _____
Enter just a fraction of form $\frac{a}{b}$ in lowest terms.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 5) $\frac{4}{3}$ 5) _____
Consider 2 lines each having slope $\frac{4}{3}$, one passing through the point (-1, 2) and the other through (3, 5). Which of the following is/are true?
(I) They are parallel.
(II) They are the same line.
(III) They cross the x-axis at the same point.
(IV) They intersect at the point (0, 3).
A) I
B) IV
C) II
D) III
E) none of these

- 6) Which of the following is/are true of the lines $2x - 5y = -15$ and $5x + 2y = 6$? 6) _____
6?
(I) They are parallel.
(II) They are perpendicular.
(III) They cross the x-axis at the same point.
(IV) They cross the y-axis at the same point.
A) II
B) I
C) II and IV
D) II and III
E) none of these

- 7) Find the equation of the following line: Parallel to $y = -9x + 4$; (2, -2) on line. 7) _____
A) $y = -9x + 16$ B) $y = -9x - 16$
C) $y = 9x - 16$ D)

$$y = -\frac{1}{9}x - \frac{16}{9}$$

8) Find the equation of the following line: Perpendicular to $y = \frac{1}{5}x + 8$; (2, 3) on line. 8) _____

A) $y = -\frac{1}{5}x - \frac{13}{5}$

B) $y = -5x - 13$

C) $y = -5x + 13$

D) $y = 5x - 13$

9) Find the equation of the following line: Parallel to $y = -\frac{1}{4}x + 8$; (4, 4) on line. 9) _____

A) $y = -\frac{1}{4}x - 5$

B) $y = -\frac{1}{4}x + 5$

C) $y = -4x - 20$

D) $y = \frac{1}{4}x - 5$

10) Find the equation of the following line: Parallel to $6x + y - 3 = 0$; (4, 3) on line. 10) _____

A) $y = 6x - 27$

B) $y = -6x - 27$

C) $y = -6x + 27$

D) $y = -\frac{1}{6}x - \frac{9}{2}$

11) Find the equation of the following line: Perpendicular to $-8x + y - 3 = 0$; (4, 3) on line. 11) _____

A) $y = -\frac{1}{8}x - \frac{7}{2}$

B) $y = \frac{1}{8}x - \frac{7}{2}$

C) $y = -\frac{1}{8}x + \frac{7}{2}$

D) $y = -8x - 28$

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

12) Find the equation of the following line: Slope is 3; y-intercept is 5. 12) _____

Enter your answer in slope-intercept form.

13) Find the equation of the following line: (2, 3) and (4, 6) on line. 13) _____

Enter your answer in slope-intercept form.

Include both the slope and the intercept in your equation.

14) Find the equation of the following line: $\left(\frac{1}{2}, 1\right)$ and (2, 0) on line. 14) _____

Enter your answer in point-slope form using $\left(\frac{1}{2}, 1\right)$.

Enter your answer in point-slope form using $\left(\frac{1}{2}, 1\right)$.

15) Find the equation of the following line: Parallel to $5x - 3y = 7$; (-1, 3) on line. 15) _____

Enter your answer in point-slope form.

form 15) _____
 with any _____
 fractions _____
 in the _____
 form of _____
 $\frac{a}{b}$ _____
 in _____
 lowest _____
 terms.

16) Find the equation of the following line: Perpendicular to $5x = 7 - 8y$; y-intercept is -2 . 16) _____
 Enter your answer in slope-intercept form with any fractions in the form $\frac{a}{b}$ in lowest terms.

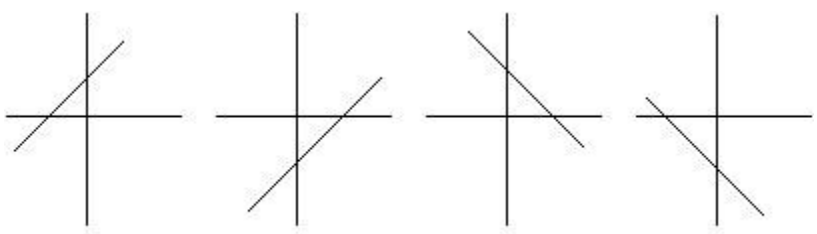
17) Find the equation of the following line: Perpendicular to $3y - \frac{5}{2}x = 1$; y-intercept is $\frac{1}{3}$. 17) _____
 Enter your answer in slope-intercept form.

18) Find the equation of the following line: Slope is $-\frac{5}{7}$; $(-\frac{1}{2}, 1)$ on line. 18) _____
 Enter your answer in point-slope form.

19) Find the equation of the following line: $(\frac{3}{2}, -4)$ and $(-\frac{3}{2}, -4)$ on the line (in the xy-plane). 19) _____
 Enter your equation in the simplest possible form.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

20) Each of the lines (I), (II), (III), and (IV) in the figure below is the graph of one of the equations (i), (ii), (iii), and (iv). Match each equation with its graph. 20) _____
 (a) $x + y = 3$ (b) $x - y = 3$ (c) $x + y = -3$ (d) $x - y = -3$



- | | | | |
|----------|-----------|------------|-----------|
| (I) | (II) | (III) | (IV) |
| A) (a) I | B) (a) IV | C) (a) III | D) (a) II |
| (b) II | (b) III | (b) II | (b) III |
| (c) III | (c) II | (c) IV | (c) I |
| (d) IV | (d) I | (d) I | (d) IV |

21) The average value of a certain type of automobile was \$15,780 in 1994 and depreciated to \$5400 in 1999. Let y be the average value of the automobile in the year x , where $x = 0$ represents 1994. Write a linear equation in slope-intercept form that models the value of the automobile, y , x years after 1994.

A) $y = -2076x + 15,780$

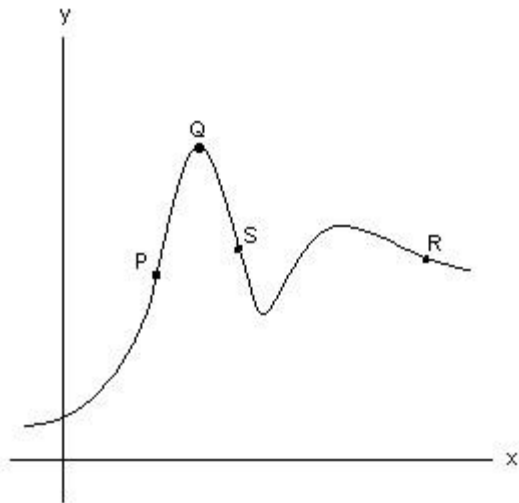
C) $y = -2076x + 5400$

B) $y = -2076x - 4980$

D) $y = -\frac{1}{2076}x - 5400$

21) _____

Referring to the graph below, assign one of the following descriptors to the point: large positive slope, small positive slope, zero slope, small negative slope, large negative slope.



22) P

A) large positive slope

C) small negative slope

B) small positive slope

D) large negative slope

22) _____

23) Q

A) zero slope

C) large negative slope

B) small negative slope

D) small positive slope

23) _____

24) S

A) large positive slope

C) small negative slope

B) large negative slope

D) zero slope

24) _____

25) R

A) small positive slope

C) large negative slope

B) small negative slope

D) zero slope

25) _____

Solve the problem.

26) Find the slope of the curve $y = x^6$ at $x = -3$.

A) slope = -1458

C) slope = 4374

B) slope = 1458

D) slope = -4374

26) _____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

27) Find the slope of the tangent line to the graph of $y = x^2$ at the point $(0.9, 0.81)$ and write the equation of the tangent line.

Ent your answer
er exactly as just

the equation in standard point-slope form.

28) Find the slope of the tangent line to the graph of $y = x^2$ at the point $\left(\frac{7}{6}, \frac{49}{36}\right)$ and write the equation of the tangent line. Enter your answer exactly as just the equation in standard point-slope form. Use all fractions of form $\frac{a}{b}$ in lowest terms.

28) _____

29) Find the slope of the tangent line to the curve $y = \sqrt[3]{x^2}$ at the point (8, 4), and write the equation of this line. Enter your answer as just the equation of the line in standard point-slope form using only fractions of form $\frac{a}{b}$ in lowest terms or integers.

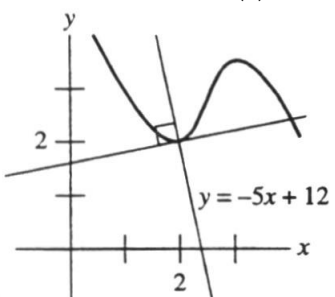
29) _____

30) Find all points at which the tangent line to the graph of $y = x^3$ is parallel to the line $y = 27x + 5$. Enter your answer in the form: (a, b), (c, d) where $a > c$

30) _____

31) Consider the curve $f(x)$ in the accompanying sketch.

31) _____



Find the slope of the tangent line at the point where $x = 2$. Enter your answer as just a fraction or an integer.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

32) Which of the following lines is/are parallel to the tangent line of the graph of $y = -x^3$ at the point where $x = 1$ and the slope of the tangent line is $-3x^2$.
 (I) $y = -3x + 1$
 (II) $y = 3x + 1$
 (III) $y = -3x - 4$
 (IV) $y = 3x + 1$
 A) (I) and (II)

32) _____

- B) (II) and (III)
- C) (III) and (IV)
- D) (I) and (III)
- E) none of these

- 33) If (x,y) is a point on the parabola $y = 3x^2$, then the tangent line to $y = 3x^2$ passing through (x,y) has slope $6x$. Find the equation of the line tangent to $y = 3x^2$ through the point $(-2, 12)$. 33) _____
- A) $y = 12x + 6$
 - B) $y = -12x - 12$
 - C) $y = 6x + 12$
 - D) $y = -2x + 12$

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

- 34) Find all points on the graph of $y = x^3$ where the curve has slope 12. The slope of the tangent line to the graph is $3x^2$. 34) _____
Enter your answer exactly in the form: (a, b) , (c, d) where $a > c$.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 35) Find the derivative of $f(x) = x^{5/2}$. 35) _____
- A) $5x^{3/2}$
 - B) $\frac{5}{2}x^{-1/2}$
 - C) $\frac{2}{5}x^{-1/2}$
 - D) $\frac{5}{2}x^{3/2}$

- 36) Find the derivative of $f(x) = \frac{1}{\sqrt[3]{x}}$. 36) _____
- A) $\frac{1}{3x^{4/3}}$
 - B) $\frac{2}{3x^{-4/3}}$
 - C) $\frac{5}{3x^2}$
 - D) none of these

- 37) Find the derivative of $f(x) = 7x - 19$ at $x = 2$. 37) _____
- A) 14
 - B) 9
 - C) 34
 - D) 7

- 38) Find the derivative of $f(x) = 2\sqrt{x}$ at $x = 4$. 38) _____
- A) $\frac{1}{2}$
 - B) $\frac{1}{2}$
 - C) -1
 - D) 2

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

- 39) Find the derivative of $f(x) = \frac{1}{x^2}$. 39) _____
Enter your answer exactly in the form: $a^x b$

- 40) Find the derivative of $f(x) = \frac{1}{\sqrt{x}}$. No 40) _____
Enter your answer exactly in the form: $a^x b$. Do not use parentheses. par ent hes es.

41) Find the derivative of $f(x) = \frac{5}{x^2}$. 41) _____

Enter your answer exactly in the form: ax^b , where a, b are integers. Do not use parentheses.

42) Find the derivative of $f(x) = 4x^{5/4}$. 42) _____

Enter your answer in the form: ax^b , where a, b are either fractions in lowest terms or integers. No parentheses.

43) Find the derivative of $f(x) = x^{6/5}$. 43) _____

Enter your answer in the form: $a^x b^c$, where a, b are either fractions of the form $\frac{c}{d}$ or integers. No parentheses.

44) Find the derivative of $f(x) = x^{4/5}$ at $x = 32$. 44) _____

Enter just a reduced fraction or an integer.

45) If $g(x) = 2x^2 - x + 3$, compute $g(1)$ and $g'(1)$. 45) _____

Enter your answer exactly in the form: $g(1) = a, g'(1) = b$ where a, b are integers.

46) Determine: $\frac{dy}{dx}$ if $y = 4 - 6x$. 46) _____

Enter your answer as just an integer.

47) Determine: $\frac{dy}{dx}$ if $y = \frac{x-2}{5}$. 47) _____

Enter your answer as just an integer or a reduced fraction.

48) What is the equation of the tangent line to the graph of $y = x^2$ 48) _____

at the point where $x = \frac{1}{3}$?

Enter your answer in standard point-slope form.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

49) Which of the following is the equation of the line tangent to the curve $y = \sqrt{x}$ at $x = 9$? 49) _____

- (I) $y = -x - \frac{1}{6}$
- (II) $y = \frac{1}{2}x + 3$
- (III) $y = \frac{1}{6}x + \frac{3}{2}$
- (IV) $y = \frac{1}{2}x^{-1/2} - \frac{1}{6}$

- A) III
- B) II
- C) IV

- D) I
E) none of these

50) $\frac{f(x+h) - f(x)}{h}$ 50) _____
If $f(x) = 2x^2 + 5x$, find _____ and simplify.

- A) $4x + 5xh + h^2 + 5h$
B) $4x + 5 + 4h$
C) $4x + 5 + 4h^2 + 5h$
D) $4x + 5h + 4h^2$
E) none of these

51) $\frac{f(x+h) - f(x)}{h}$ 51) _____
If $f(x) = -2x^2 - 3x + 2$, find _____ where $h \neq 0$.

- A) $\frac{-2x^2 - 2h^2 - 3h}{h}$
B) $\frac{-2h^2 - 3h + 2}{h}$
C) $-4x - 1$
D) $-4x - 2h - 3$
E) none of these

52) $\frac{f(x+h) - f(x)}{h}$ 52) _____
If $f(x) = -x^2 + 2x - 1$, find _____, $h \neq 0$.

- A) $-2x + 2$
B) $-2xh - x^2 + 2h$
C) $\frac{h(-2x - h)}{h}$
D) $\frac{h(-h + 2)}{h}$
E) $-2x - h + 2$

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Solve the problem.

53) $\frac{f(t+h) - f(t)}{h}$ 53) _____
If $f(t) = 5t - 4$, find _____ where $h \neq 0$ and simplify.
Enter your answer as just an integer.

54) $\frac{g(a+h) - g(a)}{h}$ 54) _____
If $g(t) = -3t^2 + 2t - 3$, find _____ and simplify.
Enter your answer exactly as a polynomial in a in standard form.

Calculate the following limit(s) if they exist.

55) $\lim_{x \rightarrow -1} (x^3 - 2x + 5)$ 55) _____
Enter just an integer or "does not exist".

56)

$$\lim_{x \rightarrow 0} 56)$$

$$\frac{(x+1)^{1/2} - 1}{x}$$

Enter your answer as just a fraction or an integer, or the words "does not exist".

-

$$57) \lim_{x \rightarrow 1} \frac{x^6 - 1}{x^3 - 1}$$

Enter your answer as just an integer or a fraction in lowest terms, or the words "does not exist".

57) _____

$$58) \lim_{x \rightarrow 5} \frac{x^2 - 8x + 15}{x^2 - 7x + 10}$$

Enter your answer as just a fraction in lowest terms or an integer, or the words "does not exist".

58) _____

$$59) \lim_{x \rightarrow 3} 4x^3$$

Enter your answer as an integer.

59) _____

$$60) \lim_{x \rightarrow 2} (2x + 2)^2$$

Enter your answer as an integer, or "does not exist".

60) _____

$$61) \lim_{x \rightarrow -1} [(x+1)^3 (x^2 + 1)\sqrt{2x+1}]$$

Enter your answer as an integer, or "does not exist".

61) _____

$$62) \lim_{x \rightarrow -1} \frac{x^2 - 4x - 5}{x + 1}$$

Enter your answer as a fraction, integer, or "does not exist".

62) _____

$$63) \lim_{x \rightarrow -1} \frac{x^2 + x - 2}{x^3 + 1}$$

Enter either a fraction, integer, or "does not exist".

63) _____

$$64) \lim_{x \rightarrow 0} \frac{1}{x^3 - 1} + 1$$

Enter either a fraction in lowest terms, an integer, or "does not exist".

64) _____

65) $\lim_{x \rightarrow 1} \frac{1}{x^3 - 1 + 1}$ 65) _____

Enter either a fraction, integer, or the words "does not exist"

66) $\lim_{x \rightarrow -2} \frac{x}{(x^3 + 8)^{-1}}$ 66) _____

Enter either a fraction, integer, or the words "does not exist".

67) $\lim_{x \rightarrow 0} \frac{g(x)}{f(x)}$ where $\lim_{x \rightarrow 0} f(x) = -\frac{1}{3}$ and $\lim_{x \rightarrow 0} g(x) = \frac{2}{3}$. 67) _____

Enter your answer as an integer, fraction in lowest terms, or the words "does not exist".

68) $\lim_{x \rightarrow 0} \frac{7}{2f(x) + g(x)}$ where $\lim_{x \rightarrow 0} f(x) = -\frac{1}{3}$ and $\lim_{x \rightarrow 0} g(x) = \frac{2}{3}$. 68) _____

Enter your answer as a fraction, integer, or the words "does not exist".

69) $\lim_{x \rightarrow \infty} \frac{3}{x^2 + 1}$ 69) _____

Enter just an integer or a fraction.

70) $\lim_{x \rightarrow \infty} \frac{x^3}{x^3 - 1}$ 70) _____

Enter just an integer or a fraction.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

71) $\lim_{x \rightarrow \infty} \frac{2x^2 + 1}{x^2 + 1}$ 71) _____

- A) 1 B) 0 C) 2 D) ∞

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

72) $\lim_{x \rightarrow -a} \frac{x - a}{x^2 - a^2}$ 72) _____

Does (where $a \neq 0$) exist?

Enter your answer as either "yes" or "no" or "does not exist".

73) $\lim_{x \rightarrow -3} \frac{x^3 - 9x}{2x + 6}$ 73) _____

Let $f(x) = \frac{x^3 - 9x}{2x + 6}$. Does $\lim_{x \rightarrow -3} f(x)$ exist?

Enter your answer as either "yes" or "no" or "does not exist".

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

74) Determine whether or not the following limit exists. If so compute the limit. $\lim_{x \rightarrow -1} \frac{x^2 - 1}{x + 1}$

74) _____

- A) 1
- B) does not exist
- C) -2
- D) 0
- E) none of these

75) Determine whether or not the following limit exists. If so compute the limit. 75) _____

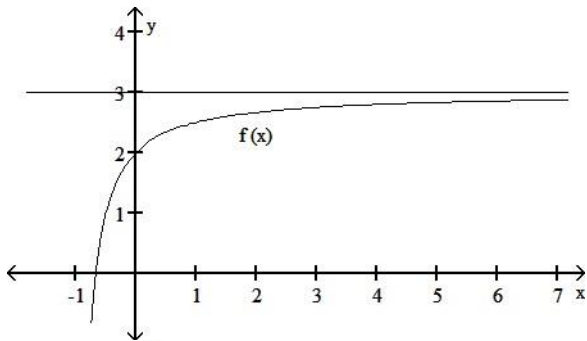
$$\lim_{x \rightarrow 3} \frac{\sqrt{x} - 4}{x^3 + 27}$$

- A) $\sqrt{3} - 4$
- B) does not exist
- C) 0
- D) $\frac{\sqrt{3} - 4}{54}$
- E) none of these

76) If $f(t) = \frac{1}{x^{2/3}}$, then $\lim_{h \rightarrow 0} \frac{f(-8+h) - f(-8)}{h}$ equals 76) _____

- A) $\frac{1}{48}$
- B) $f'(0)$
- C) $f'(8)$
- D) none of these

Using the graph below, find the given limit.



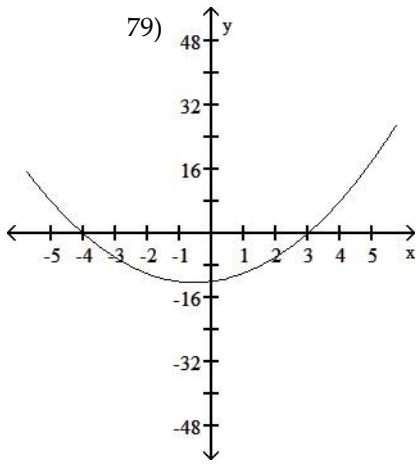
77) $\lim_{x \rightarrow \infty} (2f(x) - 1)$ 77) _____

- A) 6
- B) 0
- C) 2
- D) 5

78) $\lim_{x \rightarrow 0} [f(x)]^2$ 78) _____

- A) 0
- B) 6
- C) 4
- D) 9

79) For the following function $g(x)$, determine whether or not $\lim_{x \rightarrow 2} g(x)$ exists. If so, give the limit.



- A) 0
 B) -6
 C) 2
 D) does not exist

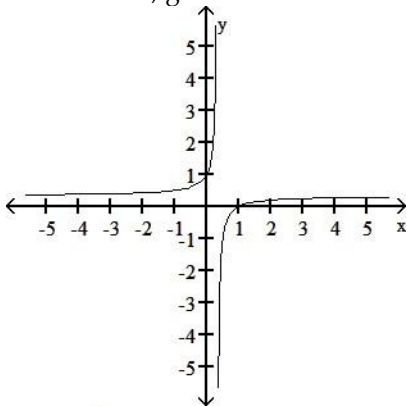
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80)

For the following function $f(x)$, determine whether or not exists. If so, give the limit.

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

80) _____



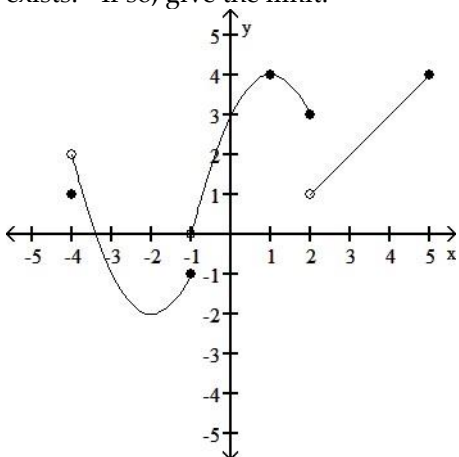
- A) $\frac{1}{3}$
 B) 0
 C) 1
 D) does not exist

81)

For the following function $g(x)$, determine whether or not exists. If so, give the limit.

$$\lim_{x \rightarrow 2} g(x)$$

81) _____



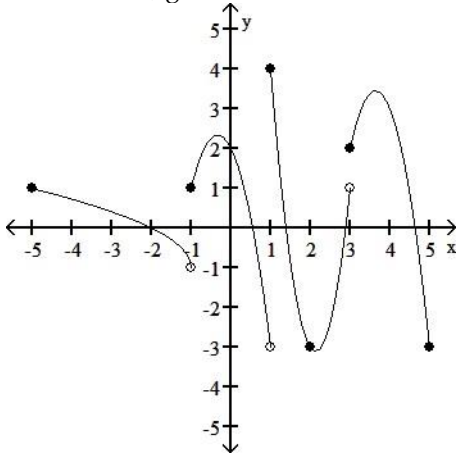
- A) 3
 B) 0
 C) 1
 D) does not exist

82)

For the following function $g(x)$, determine whether or not exists. If so, give the limit.

$$\lim_{x \rightarrow -1} g(x)$$

82) _____



- A) 1
C) 2

- B) 0
D) does not exist

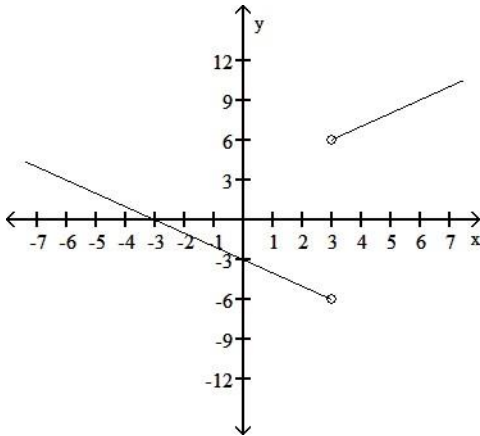
SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

83) For the following function $f(x)$, determine whether or not

83) _____

$\lim_{x \rightarrow 3} f(x)$ exists. If so, give the limit.

Enter either a real number or enter the words "does not exist".

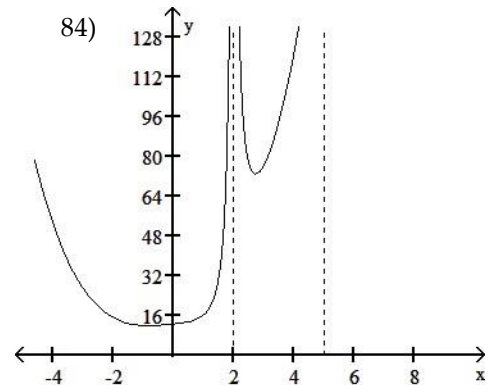


84) For the following function $f(x)$, determine whether or not

$\lim_{x \rightarrow 2} f(x)$ exists. If so, give the limit.

Enter either a real number or the words "does not exist".

84)



85) Use limits to compute $f'(5)$ where $f(x) = \sqrt{3x+1}$.
Enter just an integer or a fraction in lowest terms.

85) _____

86) Use limits to compute $f'(1)$ where $f(x) = \frac{1}{2-5x}$.
Enter just a fraction in lowest terms or an integer.

86) _____

87) Let $f(x) = \frac{1}{2^x}$. Compute $f'(3)$ using limits.
Enter a reduced fraction or an integer.

87) _____

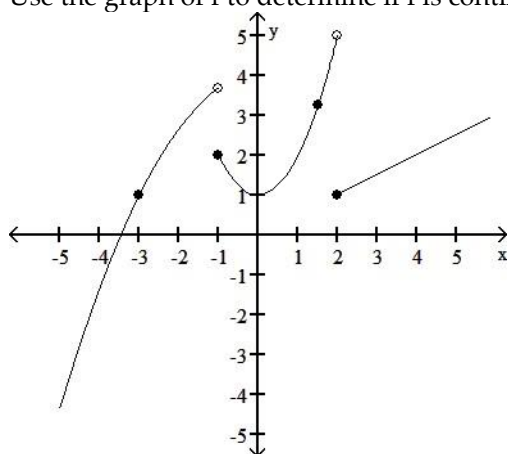
88) Let $f(x) = (2x+1)^2$. Compute $f'(0)$ using limits.
Enter a reduced fraction or an integer.

88) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

89) Use the graph of f to determine if f is continuous at $x = \frac{3}{2}$.

89) _____

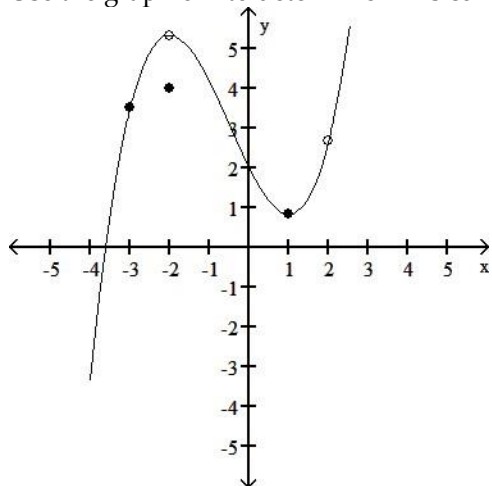


A) yes

B) no

90) Use the graph of f to determine if f is continuous at $x = -3$.

90) _____



A) yes

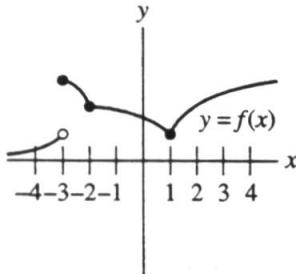
B) no

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

91) In the graph of $y = f(x)$, for which values of x is $f(x)$ not continuous?

91) _____

Enter your answer exactly in the form: $x = a$ where a is an integer. (If there is more than one value of x then enter: $x = a, b, c$)



92) $\frac{x^3 - 9x}{2x + 6}$

92) _____

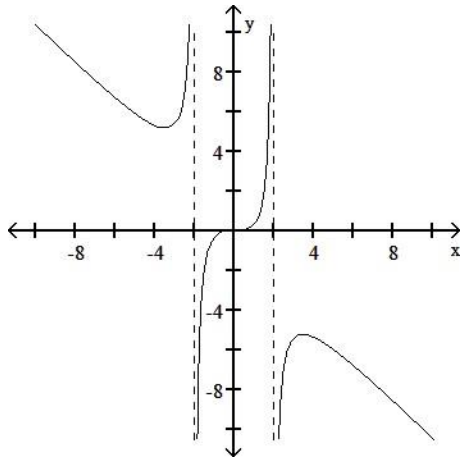
Let $f(x) = \frac{x^3 - 9x}{2x + 6}$. Is $f(x)$ continuous at $x = -3$?

Enter your answer as either "yes" or "no" or "does not exist".

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

93) For the graphed function below, state the x -values for which the derivative does not exist.

93) _____



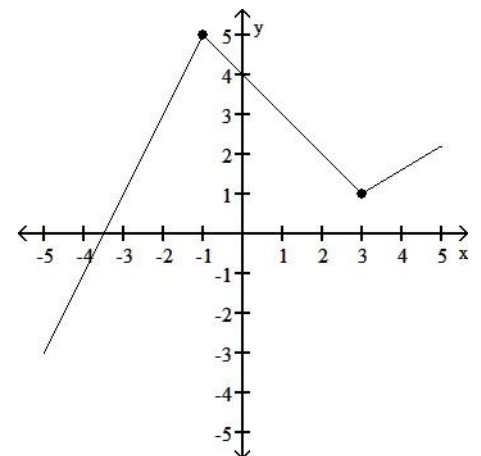
A) $x = 0, 4, -4$

B) $x = 2, -2$

C) $x = 0, 2, -2$

D) $x = 4, -4$

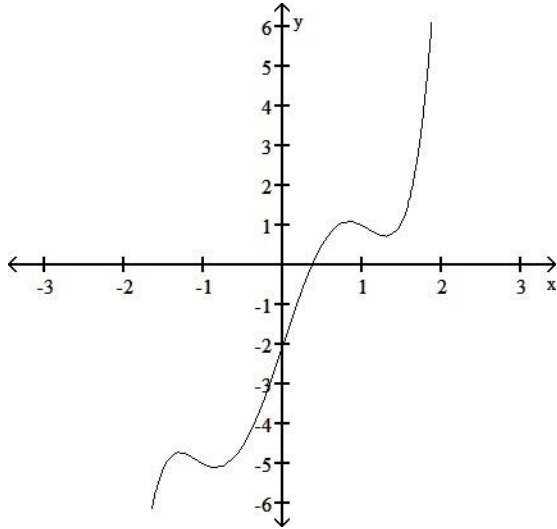
94) For the graphed function below, state the x -values for which the derivative does not exist.



94) _____

- A) $x = 3, 1, -1, 5$
- B) $x = -1, 5$
- C) $x = 3, -1$
- D) f is differentiable for all values of x

95) For the graphed function below, state the x -values for which the derivative does not exist.



- A) $x = 1, -1$
- B) $x = 0, 1, -1$
- C) $x = 0$
- D) f is differentiable for all values of x

95) _____

96) Which of the following properties are satisfied by the following

$$\text{function: } f(x) = \begin{cases} x^2 + 1 & \text{for } x < 0 \\ 1 & \text{for } x = 0 \\ 5x + 1 & \text{for } x > 0 \end{cases}$$

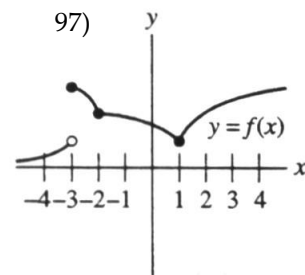
- (I) $f(x)$ is continuous
 - (II) $f(x)$ is differentiable for all x
 - (III) $f(x)$ is differentiable at $x = -2$
- A) I and III only
 - B) III only
 - C) I and II only
 - D) I only
 - E) I, II, and III

96) _____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

97) In the graph of $y = f(x)$, for which values of x is $f(x)$ not differentiable?

Enter your answer exactly in the form: $x = a, b, c$ where $a < b < c$. (If there are fewer or more terms, separate them with commas in increasing order.)



97)

98)

$$\frac{x^2 + 2x - 35}{x + 7}$$

The function $i(x) = \frac{x^2 + 2x - 35}{x + 7}$ is continuous everywhere except at $x = -7$. If possible, define $f(x)$ at $x = -7$ in a way that makes $f(x)$ continuous for all x .

Enter your answer exactly as just: $f(-7) = a$ where a is an integer or enter the words "not possible".

98) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

99) A company is planning to manufacture a new blender. After conducting extensive market surveys, the research department estimates a weekly demand of 600 blenders at a price of \$50 per blender and a weekly demand of 800 blenders at a price of \$40 per blender. Assuming the demand equation is linear, use the research department's estimates to find the revenue equation in terms of the demand x .

99) _____

A) $R(x) = 20x + \frac{x^2}{20}$

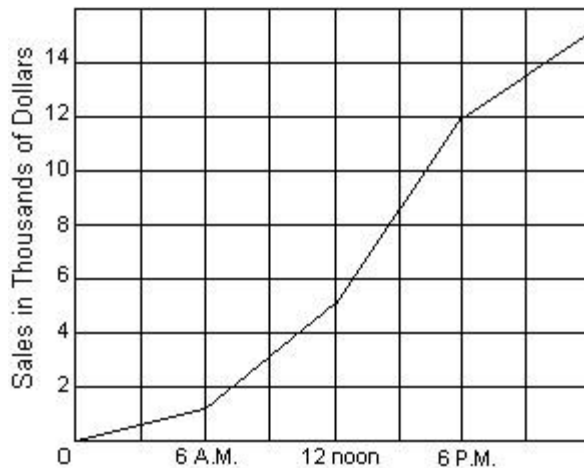
B) $R(x) = 80x - 20x^2$

C) $R(x) = 80x - \frac{x^2}{20}$

D) $R(x) = 80x - 20$

100) The graph below shows the total sales (in thousands of dollars) in a supermarket during a typical 24-hour period.

100) _____



(i) Estimate the rate of sales during the period from 6 A.M. to 12 noon.
(ii) Which 6-hour interval sees the highest rate of sales and what is this rate?

- A) (i) \$167/hr
(ii) 6pm to 12 noon
B) (i) \$667/hr
(ii) 12 noon to 6 pm \$1167/hr.
C) (i) \$1167/hr
(ii) noon to 6pm
D) none of these

Differentiate.

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

101) _____

A) $f'(x) = 4x^2 - 5$

B) $f'(x) = 8x^2 - 5$

C) $f'(x) = 4x - 5$

D) $f'(x) = 8x - 5$

102) $f(x) = 2x^4 + 5x^3 + 6$

102) _____

A) $f'(x) = 8x^3 + 15x^2 - 7$

B) $f'(x) = 4x^3 + 3x^2$

C) $f'(x) = 8x^3 + 15x^2$

D) $f'(x) = 4x^3 + 3x^2 - 7$

103) $y = -\frac{2}{3x^4}$

103) _____

A) $\frac{dy}{dx} = \frac{8}{3x^5}$

B) $\frac{dy}{dx} = \frac{8}{(3x)^5}$

C) $\frac{dx}{dy} = \frac{8}{3x^5}$

D) $\frac{dx}{dy} = \frac{24}{x^5}$

104) $f(x) = \frac{2x - (x^2 + 1)^7}{3}$

104) _____

A) $f'(x) = 2 - 7(x^2 + 1)^6$

B) $f'(x) = \frac{2-x}{3(x^2 + 1)^6}$

C) $f'(x) = \frac{2}{3} - \frac{14}{3}x(x^2 + 1)^6$

D) none of these

105) $h(x) = \frac{5}{x^3 - 4x^2 + 2}$

105) _____

A) $h'(x) = \frac{-15x^2 + 40x}{(x^3 - 4x^2 + 2)^2}$

B) $h'(x) = \frac{5}{(3x^2 - 8x)^2}$

C) $h'(x) = \frac{15x^2 - 40x}{x^3 - 4x^2 + 2}$

D) $h'(x) = \frac{3x^2 - 8x}{(x^3 - 4x^2 + 2)^2}$

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

106) $y = x^{15/19}$

106) _____

Enter your answer exactly in the form: a^x where a, b are either fractions or integers. No parentheses. No labels.

107) $y = -\frac{1}{2x^2}$

107) _____

Enter your answer exactly in the form: a^x where a, b are fractions or integers. No parentheses. If a power or coefficient is "1" then leave it off.

108) $y = \frac{5}{x^3}$

108) _____

Enter your answer in the form: ax^b . No parentheses.

109) $f(x) = \sqrt{x}$ 109) _____

Enter your answer as just: $a^x b$. No parentheses.

110) $f(x) = \frac{1}{x^2 + 5}$ 110) _____

Enter your answer as just: $\frac{P(x)}{(Q(x))^a}$ where P(x) and Q(x) are polynomials in standard form.

111) $F(x) = \sqrt{3x + 1}$ 111) _____

Enter your answer as just: $a^{P(x)b}$ where P(x) is a polynomial in standard form.

112) $y = \frac{1}{x^2 + 1}$ 112) _____

Enter your answer exactly in the form: $\frac{P(x)}{(Q(x))^a}$ where P(x) and Q(x) are polynomials in standard form.

113) $y = \frac{3}{4x^2 + 1}$ 113) _____

Enter your answer exactly as just: $\frac{P(x)}{(Q(x))^a}$ where P(x) and Q(x) are polynomials in standard form.

114) $y = \frac{4}{4x + 1}$ 114) _____

Enter your answer exactly as just: $\frac{P(x)}{(Q(x))^a}$ where P(x) and Q(x) are polynomials in standard form.

115) $y = 3\sqrt{5x^2 + 2}$ 115) _____

Enter your answer exactly as: $\frac{dy}{dx} = \frac{P(x)}{\sqrt{Q(x)}}$ where P(x) and Q(x) are polynomials in standard form.

116) $y = \sqrt{x^4 + 1}$ 116) _____

Enter your answer exactly as: $\frac{dy}{dx} = \frac{P(x)}{\sqrt{Q(x)}}$ where P(x) and Q(x) are polynomials in standard form.

117) $y = \sqrt{3x^2 + 4x}$ 117) _____

Enter your answer exactly as: $\frac{dy}{dx} = \frac{P(x)}{\sqrt{Q(x)}}$ where P(x) and Q(x) are polynomials in standard form.

118) $y = \frac{2}{\sqrt{2x+1}}$

118) _____

Enter your answer exactly as: $\frac{dy}{dx} = a(P(x))^b$ where P(x) is a polynomial in standard form. a, b reduced fractions or integers. No parentheses on coefficients or powers.

119) $y = \frac{4}{3x^3 + x^2 + 4}$

119) _____

Enter your answer as just: $\frac{P(x)}{(Q(x))^a}$ where P(x) and Q(x) are polynomials in standard form.

120) $y = \frac{1}{\sqrt{2x+1}}$

120) _____

Enter your answer as just: $\frac{P(x)}{(Q(x))^a}$ where P(x) and Q(x) are polynomials in standard form.

121) Find the slope of the graph of $y = (x^2 - 7)^3$ at $x = 3$.
Enter just an integer.

121) _____

122) Find the slope of the graph of $f(x) = 1 + 3x - x^2$ at $x = 5$.
Enter just an integer.

122) _____

123) Find the slope of the graph of $y = x^9 - 2x + (\sqrt{5-x})^3$ at (1, 7).
Enter just an integer.

123) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

124) Find the slope of the graph of $y = \sqrt{2x^2 + 1}$ at the point (2, 3).

124) _____

A) $\frac{1}{4}$

B) $\frac{3}{2}$

C) 12

D) $\frac{4}{3}$

E) none of these

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

125) Let $g(x) = 2x^3 - 5x^2 + 1$; find $g'(3)$.

125) _____

Enter just an integer.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

126) Find the slope of the tangent line to the curve

126) _____

$$y = \frac{4}{3(x^3 - 2x^2 + 3x - 5)} \text{ at } \left(2, \frac{4}{3}\right).$$

- A) $\frac{28}{3}$ B) $\frac{4}{3}$ C) $\frac{8}{3}$ D) $\frac{2}{3}$ E) $\frac{8}{3}$

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

127) _____

Find the slope of the tangent line to the curve $y = \frac{3}{(x+2)^2}$ at $x = 3$.

Enter a reduced fraction only.

128) _____

Find the slope of the tangent line to the curve $y = 2(x^3 + 4)^2$ at $x = -1$.

Enter just an integer.

129) _____

Find the slope of the tangent line to the curve $y = 3x^4 + 2x^3$ at $x = 1$.

Enter just an integer.

130) _____

Find the equation of the tangent line to the curve $y = \frac{1}{x+2}$ at $\left(2, \frac{1}{4}\right)$.

Enter your answer in standard slope-intercept form using reduced fractions. No parentheses.

131) _____

Find the equation of the tangent line to the curve $y = \sqrt{x^2 + 5}$ at $(2, 3)$.

Enter your answer in standard point-slope form using reduced fractions and integers.

132) _____

Find the equation of the tangent line to the curve $y = 1 + 3x - x^2$ at $x = 5$.

Enter your answer in standard slope-intercept form.

133) _____

Find the equation of the tangent line to the curve $y = x^3 + 4x^2 + 4$ at $(1, 9)$.

Enter your answer in standard slope-intercept form.

134) _____

Find the equation of the tangent line to the curve $y = x^3 + 3x - 8$ at $x = 2$.

Enter your answer in standard point-slope form.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

135) Find the

equation 135)

of the
tangent
line to
the
graph of

$y = \frac{3}{5x+2}$
at
 $x = 3$.

A) $y = \frac{15}{(5x-2)^2}$

B) $y - 3 = 15(5x - 2)^{-2}$

C) $y = \frac{15}{169}(x - 3)$

D) $y = \frac{15}{289}(x - 3) - \frac{3}{17}$

136)

The tangent line to the curve $y = \frac{1}{6}x^3 - \frac{1}{4}x^2 - x + 4$ is perpendicular to the line $18x + 9y = -37$ at two points on the curve. Find the two points.

A) $\left(2, \frac{7}{3}\right), \left(-1, \frac{55}{12}\right)$

B) $(2, 0), (-1, 0)$

C) $\left(2, \frac{7}{3}\right), \left(1, \frac{55}{12}\right)$

D) $\left(-2, -\frac{1}{3}\right), \left(1, \frac{59}{12}\right)$

136) _____

137)

Find the first derivative of $w(t) = 7t^2 - 19\sqrt{t} + 23$

A) $14t - \frac{19}{2\sqrt{t}}$

B) $\frac{7}{2}t - \frac{19}{2}\sqrt{t}$

C) $\frac{7}{2}t - \frac{19}{2\sqrt{t}}$

D) $14t - \frac{19}{2}\sqrt{t}$

137) _____

138)

Find the first derivative of $y = T^7 - 9T^5 + 2T^4 + 59$

A) $7T^6 - 45T^4 + 8T^3$

B) $T^6 - 9T^4 + 2T^3$

C) $7T^6 - 45T^4 + 8T^3 + 59$

D) $T^6 - 9T^4 + 2T^3 + 59$

138) _____

139)

Find $\frac{d}{du}\sqrt{u^4 - 7}$.

A) $\frac{2u^3}{\sqrt{u^4 - 7}}$

B) $\frac{2u}{\sqrt{u^2 - 7}}$

C) $\frac{2u}{\sqrt{u^4 - 7}}$

D) $\frac{4u}{\sqrt{u^2 - 7}}$

139) _____

140)

Find $\frac{d}{ds}(p^2s^4 - q^4r^3s^2)$

A) $2ps^4 - 4q^3r^3s^2$

B) $4p^2s^3 - 2q^4r^3s$

C) $8ps^3 - 24q^3r^2s$

D) $8p^2s^3 - 24q^4r^3s$

140) _____

141)

Find the second derivative of $y = \frac{1}{2x} + 3$.

A)

141) _____

$$\frac{1}{6x^4}$$

- B) $2x^0$
- C) $-6x^4$
- D) $\frac{1}{6x^4}$
- E) none of these

142) Find the second derivative of $f(x) = 7x^2 + 7x - 7$ 142) _____
A) 0 B) 14 C) 7 D) $14x + 7$

143) Find the second derivative of $f(x) = 3x^4 - 7x^2 + 6$. 143) _____
A) $36x^2 - 14$ B) $12x^2 - 14x$
C) $36x^2 - 14x$ D) $12x^2 - 14$

144) $f(x) = \frac{1}{3}x^{3/2} - \frac{4}{3}x^{1/4} + 5x - 2$ 144) _____
Find the second derivative of
A) $x^{1/2} + \frac{4}{9}x^{-7/4}$
B) $\frac{2}{9}x^{1/2} - \frac{16}{3}x^{-3/4} + 5$
C) $\frac{1}{4}x^{-1/2} - \frac{1}{4}x^{-7/4}$
D) $\frac{1}{2}x^{1/2} - \frac{1}{3}x^{-3/4} + 5$
E) $\frac{1}{4}x^{-1/2} + \frac{1}{4}x^{7/4}$

145) $f(x) = \frac{2x}{3x^2 + 4x}$ for $x \neq 0$. 145) _____
Find the second derivative of
A) $12(3x + 4)^{-3}$
B) $36(3x + 4)^{-3}$
C) $-6(3x + 4)^{-2}$
D) $2(3x + 4)^{-1}$
E) $(-2)^{3-2}$

146) $f(x) = \frac{3}{2x - 4}$ for $x \neq 0$. 146) _____
Find the second derivative of
A) 0
B) $-6(2x - 4)^{-2}$
C) $3(2x - 4)^{-1}$
D) $12(2x - 4)^{-3}$
E) $24(2x - 4)^{-3}$

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

147) Find the second derivative of $f(x) = 3x^4 - 4x^3 + 5x + 1$. 147) _____
Enter just a polynomial in standard form, unlabeled.

148) Find the second derivative of $y = \pi + \sqrt{3}$. 148) _____
Do not label your answer.

149) Compute the third derivative of $f(x) = 3x^4 - 4x^3 + 5x + 1$. 149) _____
Enter your answer as an unlabeled polynomial in x in standard form.

150) Compute the third derivative of the following function: $f(z) = \frac{3}{2z-2}$ at $z = \frac{5}{2}$. 150) _____
Enter just a reduced fraction of form $\frac{a}{b}$.

151) Find the first derivative of $y = (x^3 + 4x)^5$ at $x = 1$. 151) _____
Enter just an integer.

152) Find the first derivative of $z = 4t + (3 - \sqrt{2t+1})^3$ at $t = \frac{3}{2}$. 152) _____
Enter just a fraction of form $\frac{a}{b}$ in lowest terms.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

153) Let $V = \frac{4}{3}\pi r^3$. Compute $\left. \frac{dV}{dr} \right|_{r=2}$. 153) _____
A) $\frac{16\pi}{9}$
B) 16π
C) 8π
D) $\frac{32}{3}$
E) none of these

154) Let $y = (-4 + 3\sqrt{x})^4$. Compute $\left. \frac{dy}{dx} \right|_{x=4}$. 154) _____
A) $\frac{27}{16}$
B) 6
C) 24
D) -6
E) none of these

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

155) Let $y = \sqrt{5t^2 - 6}$. Compute $\left. \frac{dy}{dt} \right|_{t=2}$.
 Enter just a reduced fraction of form $\frac{a}{b}$.

155) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

156) Compute $\left. \frac{d^2}{dt^2}(2\sqrt{2t}) \right|_{t=4}$.
 A) $\frac{1}{16}$
 B) $\frac{1}{8}$
 C) $\frac{1}{2}$
 D) $\frac{1}{8}$
 E) none of these

156) _____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

157) Compute $\left. \frac{d^2y}{dy^2} \left(\frac{9t^2/3}{2} \right) \right|_{t=8}$.
 Enter just a reduced fraction of form $\frac{a}{b}$.

157) _____

158) Let $f(t) = t^3 - \frac{9}{t}$. Compute $\left. \frac{d^2f}{dt^2} \right|_{t=3}$.
 Enter just a fraction $\frac{a}{b}$ in lowest terms.

158) _____

159) Compute $f''(2)$ when $f(t) = \frac{3}{(3t-1)^2}$.
 Enter just a reduced fraction of form $\frac{a}{b}$.

159) _____

160) Compute $\frac{d}{dt} \left(\frac{dv}{dt} \right)$, where $v = -5t^3 + \frac{2}{1-t}$ at $t = -1$.
 Enter just a reduced fraction of form $\frac{a}{b}$.

160) _____

161) Find second derivative of $y = x^{3/2} + x^2$ at $x = 4$.
 Enter just a fraction of form $\frac{a}{b}$ in lowest terms.

161) _____

162) Find second derivative of $y = (2x - 4)^5$ at $x = -1$.

Enter just an

integer. 162)

163) Find the second derivative of $f(s) = \frac{4}{3}\pi s^3$ at $s = \frac{1}{\pi}$.
Enter just a real number.

163) _____

164) Find the second derivative of $U = (3u - 7)^4 - u^3$ at $u = \frac{5}{3}$.
Enter just a real number.

164) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

165) Find the average rate of change for $f(x) = -2x^2 + 5x - 2$ on $[-1, 1]$
A) 0
B) 10
C) 3
D) undefined
E) 5

165) _____

166) Find the average rate of change for $f(x) = -3x^2 - 2x + 5$ on $[-2, 1]$
A) 1 B) 3 C) 0 D) -3 E) -7

166) _____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

167) An automobile's brakes are applied at time $t = 0$ when the vehicle is traveling at 48 ft/sec. The brakes cause the automobile to decelerate so that after t sec the velocity is given by $v(t) = 48 - 16t$. At what rate is the vehicle decelerating after 1 sec?
Enter just an integer, no units.

167) _____

168) Suppose that t hours after being placed in a freezer, the temperature of a piece of meat is given by
 $f(t) = 70 - 12t + \frac{4}{t+1}$.
How fast is the temperature of the meat falling 3 hours after being placed in the freezer?

168) _____

Enter your answer as a reduced fraction of the form $\frac{a}{b}$, no units.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

169) During the month of February, a flu epidemic hit the University. The number of people sick at time t (measured in days) is given by the function $P(t)$. The rate at which the epidemic is spreading on February 3 is 110 people per day. How is the information best represented mathematically?
A) $P'(3) = 110$
B)

169) _____

$$\left. \frac{dP}{dt} \right|_{t=3} = P'(3)$$

C) $P(3) = 110$

D) $\left. \frac{dP}{dt} \right|_{t=110}$

E) none of these

170) Which of the following is the best description of $f'(t)$?

170) _____

A) The derivative as a function is the best approximation of the tangent to line to $f(x)$.

B) $\frac{f(t+h) - f(t)}{h}$
It is approximately equal to $\frac{f(t+h) - f(t)}{h}$, as h gets very small.

C) It is a function which gives the slope of the secant line through any two points.

D) $\frac{f(t)}{t}$
 $f'(t) = \frac{f(t)}{t}$

E) $f'(a)$ measures the rate of change of $f(t)$ per unit change in t at the point $t = a$.

171) At time $t = 0$, a seed is planted. After t weeks, the height of the plant is given by $f(t) = 0.3t^2 + 0.6t + 0.5$ inches. At what rate is the plant growing after 8 weeks?

171) _____

A) 5.4 inches/week

B) 10.1 inches/week

C) 24.5 inches/week

D) $0.6t + 0.6$ inches/week

E) none of these

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

172) A winter storm front moves through campus. At t hours after the onset of the storm, the temperature is given by

172) _____

$T(t) = 35 - 2t^2 + t$. At what rate is the temperature changing 3 hours after the storm begins? Enter just an integer, no units.

173) A winter storm front moves through campus. At t hours after the onset of the storm, the temperature is given by

173) _____

$T(t) = 35 - 2t^2 + t$. What is the average rate at which water pours into the tub over the first 4 minutes? Enter just a real number to one decimal place, no units.

174) A winter storm front moves through campus. At t hours after the onset of the storm, the temperature is given by

174) _____

$T(t) = 35 - 2t^2 + t$. At what instantaneous rate is the water flowing when $t = 4$?

Enter your answer as just a real number to one decimal place, no units.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 175) Find the (instantaneous) velocity at time $t = 2$ seconds for a falling object 175) _____
 where the height function is given by $h(t) = -16t^2 + 60t + 30$ in feet.
 A) 28 feet/second
 B) 4 feet/second
 C) -86 feet/second
 D) -4 feet/second
 E) 86 feet/second

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

- 176) A ball is thrown straight up. Its height, in feet, at time t , in seconds, is represented by the equation $h(t) = 30t - 16t^2 + 6$. Determine the instantaneous velocity of the ball at $t = 2$. Enter just an integer (no units) 176) _____
- 177) A point P is moving along the x -axis. At any time t , the location of P on the x -axis is described by $x = t^3 - 4t^2 + 3t$. Determine the point's instantaneous velocity when $t = 5$. Enter just an integer. 177) _____
- 178) A point P is moving along the x -axis. At any time t , the location of P on the x -axis is described by $x = t^3 - 4t^2 + 3t$. Determine the instantaneous acceleration at time $t = 5$ of the point P . Enter just an integer. 178) _____
- 179) A rock is thrown off a cliff. Its distance from the ground below at t seconds is $s(t) = -16t^2 + 16t + 96$ feet. What is the velocity after 1 second? Enter just an integer. No units. 179) _____
- 180) A rock is thrown off a cliff. Its distance from the ground below at t seconds is $s(t) = -16t^2 + 16t + 96$ feet. What is the velocity of the rock when it slams into the ground? Enter just an integer. 180) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

marginals

- 181) $C(x) = x^3 - \frac{1}{2x^2} + 3x + 2$, 181) _____
 If the cost function for producing a product is find the answer closest to the marginal cost at a production level of 10 units.
 A) -697 B) 297 C) .30 D) 293 E) 697
- 182) If the revenue function is $R(x) = x^{2/3} + 2x^{1/2} + 6x + 2$ for producing a product, find the marginal revenue at a production level of 10 units. 182) _____
 A) $\frac{2}{3}(10)^{-1/3} + (10)^{1/2} + 6$

B) $\frac{2}{3}(10)^{-1/3} + (10)^{-1/2} + 6$

C) $\frac{2}{3}(10)^{1/3} + (10)^{1/2} + 6$

D) $(10)^{2/3} + 2(10)^{1/2} + 6(10) + 2$

E) $\frac{2}{3}(10)^{-1/3} + 4(10)^{-1/2} + 6$

183) $P(x) = \frac{5x^2}{3} + \frac{2}{3x} + 2x - 10$ 183) _____

If the profit function is _____ for producing a product, find the marginal profit at a production level of 10 units.

A) 423 B) $\frac{5299}{150}$ C) $\frac{252}{75}$ D) 60 E) $\frac{2651}{150}$

184) What is the difference between the actual increase in profit as 184) _____

production increases from 5 to 6 units, and the marginal profit at a production level of 5 units where the profit function is given by

$P(x) = 3x^2 - 5x + 2$?

A) 0 B) 25 C) 27 D) 3 E) 6

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

185) A ball is thrown straight up. Its height, in feet, at time t, in 185) _____

seconds, is represented by the equation $h(t) = 20t - 16t^2 + 10$. Determine the maximum height of the ball. (Hint: Consider the velocity of the ball at the moment the ball reaches its maximum height.)

Enter just a reduced fraction of form $\frac{a}{b}$. No units.

186) A rock is thrown off a cliff. Its distance from the ground below 186) _____

at t seconds is $s(t) = -16t^2 + 16t + 96$ feet. When will it hit the ground?

Enter your answer exactly as: t = a. No units.

187) A rock is thrown off a cliff. Its distance from the ground below 187) _____

at t seconds is $s(t) = -16t^2 + 16t + 96$ feet. How high was the cliff?

Enter just an integer, no units.

188) A manufacturer's profit from producing x units of a product is 188) _____

given by $P(x) = 0.002x^3 - 0.01x^2 + 0.5x$. What is the marginal profit when the production level is at 50 units? Enter your answer as a real number to two decimal places, no units.

189) A manufacturer's profit from producing x units of a product is 189) _____

given by $P(x) = 0.002x^3 - 0.01x^2 + 0.5x$. At what production level(s) will the marginal profit be \$9.30 per unit?

Enter integer, no r units. just an

189) _____

190) A winter storm front moves through campus. At t hours after the onset of the storm, the temperature is given by $T(t) = 35 - 2t^2 + t$. What is the temperature 3 hours after the storm begins?
Enter just an integer, no units.

190) _____

191) An automobile's brakes are applied at time $t = 0$ when the vehicle is traveling at 48 ft/sec. The brakes cause the automobile to decelerate so that after t sec the velocity is given by $v(t) = 48 - 16t$. How long will it take for the vehicle to come to a complete stop?
Enter just an integer, no units.

191) _____

192) Suppose that t hours after being placed in a freezer, the

$$f(t) = 70 - 12t + \frac{4}{t+1}.$$

temperature of a piece of meat is given by
What is the temperature of the meat after 3 hours?
Enter just an integer, no units.

192) _____

1) B

2) -5

3) $\frac{1}{2}$

4) $\frac{1}{2}$

5) A

6) C

7) A

8) C

9) B

10) C

11) C

12) $y = 3x + 5$

13) $y = \frac{3}{2}x$

14) $y - 1 = -\frac{2}{3}\left(x - \frac{1}{2}\right)$

15) $y - 3 = \frac{5}{3}(x + 1)$

16) $y = \frac{8}{5}x - 2$

17) $y = -\frac{6}{5}x + \frac{1}{3}$

18) $y - 1 = -\frac{5}{7}\left(x + \frac{1}{2}\right)$

19) $y = -4$

20) C

21) A

22) A

23) A

24) B

25) B

26) A

27) $y - .81 = 1.8(x - .9)$

28) $y - \frac{49}{36} = \frac{7}{3}\left(x - \frac{7}{6}\right)$

29) $y - 4 = \frac{1}{3}(x - 8)$

30) (3, 27), (-3, -27)

31) $\frac{1}{5}$

32) D

33) B

34) (2, 8), (-2, -8)

35) D

36) A

37) D

- 38) A
- 39) $-2x^{-3}$
- 40) $\frac{1}{2x^{-3/2}}$
- 41) $-10x^{-3}$
- 42) $5x^{1/4}$
- 43) $\frac{6}{5}x^{1/5}$
- 44) $\frac{2}{5}$
- 45) $g(1) = 4, g'(1) = 3$
- 46) -6
- 47) $\frac{1}{5}$
- 48) $y - \frac{1}{9} = \frac{2}{3}\left(x - \frac{1}{3}\right)$
- 49) A
- 50) E
- 51) D
- 52) E
- 53) 5
- 54) $-6a + 2 - 3h$
- 55) 6
- 56) $\frac{1}{2}$
- 57) 2
- 58) $\frac{2}{3}$
- 59) 108
- 60) 36
- 61) 0
- 62) -6
- 63) does not exist
- 64) 0
- 65) does not exist
- 66) 0
- 67) -2
- 68) does not exist
- 69) 0
- 70) 1
- 71) C
- 72) no
- 73) yes
- 74) C
- 75) D
- 76) A
- 77) D
- 78) C
- 79) B
- 80) C

- 81) D
- 82) D
- 83) does not exist
- 84) does not exist
- 85) $\frac{3}{8}$
- 86) $\frac{5}{9}$
- 87) $\frac{1}{18}$
- 88) 4
- 89) A
- 90) A
- 91) $x = -3$
- 92) no.
- 93) B
- 94) C
- 95) D
- 96) A
- 97) $x = -3, -2, 1$
- 98) $f(-7) = -12$
- 99) C
- 100) B
- 101) D
- 102) C
- 103) A
- 104) C
- 105) A
- 106) $\frac{15}{19x-4/19}$
- 107) x^{-3}
- 108) $-15x^{-4}$
- 109) $\frac{1}{2x-1/2}$
- 110) $\frac{-2x}{(x^2+5)^2}$
- 111) $\frac{3}{2}(3x+1)^{-1/2}$
- 112) $\frac{-2x}{(x^2+1)^2}$
- 113) $\frac{-24x}{(4x^2+1)^2}$
- 114) $\frac{16}{(4x+1)^2}$
- 115) $\frac{dy}{dx} = \frac{15x}{\sqrt{5x^2+2}}$
- 116) $\frac{dy}{dx} = \frac{2x^3}{\sqrt{x^4+1}}$

$$117) \frac{dy}{dx} = \frac{3x+2}{\sqrt{3x^2+4x}}$$

$$118) \frac{dy}{dx} = -2(2x+1)^{-3/2}$$

$$119) \frac{-36x^2 - 8x}{(3x^3 + x^2 + 4)^2}$$

$$120) \frac{-1}{(2x+1)^{3/2}}$$

121) 72

122) -7

123) 4

124) D

125) 24

126) A

$$127) \frac{6}{125}$$

128) 36

129) 18

$$130) y = -\frac{1}{16}x + \frac{3}{8}$$

$$131) y - 3 = \frac{2}{3}(x-2)$$

$$132) y = -7x + 26$$

$$133) y = 11x - 2$$

$$134) y - 6 = 15(x - 2)$$

135) D

136) A

137) A

138) A

139) A

140) B

141) E

142) B

143) A

144) C

145) B

146) E

$$147) 36x^2 - 24x$$

148) 0

$$149) 72x - 24$$

$$150) \frac{16}{9}$$

151) 21,875

$$152) \frac{5}{2}$$

153) B

154) C

$$155) \frac{10}{\sqrt{14}}$$

156) E

157) $\frac{1}{16}$

158) $\frac{52}{3}$

159) $\frac{162}{625}$

160) $\frac{61}{2}$

161) $\frac{19}{8}$

162) -17,280

163) 8

164) 422

165) E

166) A

167) 16

168) $\frac{49}{4}$

169) A

170) E

171) A

172) -11

173) 12.3

174) 40.3

175) D

176) -34

177) 38

178) 22

179) -16

180) 80

181) B

182) B

183) B

184) D

185) $\frac{65}{4}$

186) $t = 3$

187) 96

188) 14.50

189) 40

190) 20

191) 3

192) 35