

Chapter 02 Form D**MULTIPLE CHOICE**

1. The position of a car is given by the values in the following table. Find the average velocity for the time period beginning when $t = 2$ and lasting 2 seconds.

- a. 35.5
- b. 47.5
- c. 39
- d. 37.5
- e. 33.5

ANS: D

PTS: 1

DIF: Medium

MSC: Multiple Choice

NOT: Section 2.6

2. If an equation of the tangent line to the curve $y = f(x)$ at the point where $a = 2$ is $y = 4x - 11$, find $f(2)$ and $f'(2)$

- a. $f(2) = -4$
 $f'(2) = 4$
- b. $f(2) = 3$
 $f'(2) = 4$
- c. $f(2) = -4$
 $f'(2) = 3$
- d. $f(2) = -3$
 $f'(2) = 4$
- e. none of these

ANS: D

PTS: 1

DIF: Medium

MSC: Multiple Choice

NOT: Section 2.7

3. Use the graph of the function to state the value of $\lim_{x \rightarrow 0} f(x)$, if it exists.

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

- a. 0
- b. $\frac{1}{3}$
- c. $-\frac{1}{3}$
- d. ∞
- e. does not exist

ANS: E

PTS: 1

DIF: Medium

MSC: Multiple Choice

NOT: Section 2.2

4. The slope of the tangent line to the graph of the exponential function $y = 8^x$ at the point $(0, 1)$ is

$$\lim_{x \rightarrow 0} \frac{8^x - 1}{x}.$$

Estimate the slope to three decimal places.

- a. 1.293
- b. 2
- c. 2.026
- d. 1.568
- e. 2.079
- f. 2.556

ANS: E

PTS: 1

DIF: Medium

MSC: Multiple Choice

NOT: Section 2.8

5. Find the limit.

$$\lim_{x \rightarrow -\infty} \frac{\sqrt{x^2 - 9}}{2x - 6}$$

- a. $-\frac{1}{2}$
- b. $\frac{3}{2}$
- c. $-\frac{3}{2}$
- d. 0
- e. does not exist

ANS: A

PTS: 1

DIF: Medium

MSC: Multiple Choice

NOT: Section 2.3

6. Find an equation of the tangent line to the curve $y = x^3 - 2x$ at the point $(2, 4)$.

- a. $y = 16 - 10x$
- b. $y = 10x - 8$
- c. $y = x - 16$
- d. $y = 10x + 16$
- e. none of these

ANS: E

PTS: 1

DIF: Medium

MSC: Multiple Choice

NOT: Section 2.7

7. Estimate the value of the following limit by graphing the function $f(x) = \frac{(3 \sin x)}{(\sin \pi x)}$. State your answer correct to two decimal places.

$$\lim_{x \rightarrow 0} \frac{3 \sin x}{\sin \pi x}$$

- a. 3.00
- b. 3.14
- c. 0.95
- d. 0.64
- e. -3.14
- f. -6.28

ANS: C PTS: 1 DIF: Medium MSC: Multiple Choice
NOT: Section 2.2

8. Let $F(x) = \frac{x^2 - 1}{|x - 1|}$. Find the following limits.

$$\lim_{x \rightarrow 1^+} F(x), \quad \lim_{x \rightarrow 1^-} F(x)$$

- a. both 2
- b. 2 and 1
- c. 2 and -2
- d. 2 and -1
- e. both 1

ANS: C PTS: 1 DIF: Medium MSC: Multiple Choice
NOT: Section 2.6

9. Use continuity to evaluate the limit.

$$\lim_{x \rightarrow 13\pi} \sin(x + 4 \sin x)$$

- a. 13π
- b. -1
- c. 0
- d. ∞
- e. 1

ANS: C PTS: 1 DIF: Medium MSC: Multiple Choice
NOT: Section 2.5

10. If $g(x) = \sqrt{3 - 5x}$, find the definition of derivative to find $g'(x)$.

- a. $g'(x) = -\frac{5}{2}(3 - 5x)^{-1/2}$
- b. $g'(x) = -\frac{1}{2}(3 - 5x)^{1/2}$
- c. $g'(x) = -(3 - 5x)^2$
- d. $g'(x) = -\frac{5}{2}(3 - 5x)^{-2}$
- e. none of these

ANS: A PTS: 1 DIF: Medium MSC: Multiple Choice
NOT: Section 2.2

11. For what value of the constant c is the function f continuous on $(-\infty, \infty)$?

$$f(x) = \begin{cases} cx + 7 & \text{for } x \leq 2 \\ cx^2 - 5 & \text{for } x > 2 \end{cases}$$

- a. $c = 1$
- b. $c = 2$
- c. $c = 6$
- d. $c = -2$
- e. $c = 7$

ANS: C PTS: 1 DIF: Medium MSC: Multiple Choice
NOT: Section 2.7

12. How would you define $f(4)$ in order to make f continuous at 4?

$$f(x) = \frac{x^2 - x - 12}{x - 4}$$

- a. $f(4) = 0$
- b. $f(4) = 1$
- c. $f(4) = 7$
- d. $f(4) = 4$
- e. none of these

ANS: C PTS: 1 DIF: Medium MSC: Multiple Choice
NOT: Section 2.7

13. Use the graph of the function to state the value of $\lim_{x \rightarrow 0} f(x)$, if it exists.

$$f(x) = \frac{1}{1 + 4^{1/x}}$$

- a. 0
- b. $\frac{1}{5}$
- c. 1
- d. ∞
- e. does not exist

ANS: E PTS: 1 DIF: Medium MSC: Multiple Choice
NOT: Section 2.2

14. If $2x - 1 \leq f(x) \leq x^2$, find $\lim_{x \rightarrow 1} f(x)$.

- a. 1
- b. -1

- c. 0
- d. 3
- e. 5

ANS: A PTS: 1 DIF: Medium MSC: Multiple Choice
NOT: Section 2.3

15. Find an equation of the tangent line to the parabola $y = 3x^2$ at the point $(-3, 27)$.

- a. -18
- b. 81
- c. 27
- d. -3
- e. 18

ANS: A PTS: 1 DIF: Medium MSC: Multiple Choice
NOT: Section 2.7

16. The cost (in dollars) of producing x units of a certain commodity is $C(x) = 4,280 + 13x + 0.03x^2$. Find the average rate of change with respect to x when the production level is changed from $x = 102$ to $x = 118$.

- a. 29.6
- b. 19.6
- c. 18.6
- d. 26.6
- e. 24.6

ANS: B PTS: 1 DIF: Medium MSC: Multiple Choice
NOT: Section 2.7

17. Find the limit.

$$\lim_{t \rightarrow \infty} \frac{t^2 + 3}{t^3 + t^2 - 1}$$

- a. ∞
- b. 0
- c. -3
- d. 3
- e. 2

ANS: B PTS: 1 DIF: Medium MSC: Multiple Choice
NOT: Section 2.3

18. If a ball is thrown into the air with a velocity of 58 ft/s, its height (in feet) after t seconds is given by $H = 58t - 16t^2$. Find the velocity when $t = 4$.

- a. 58 ft/s
- b. -70 ft/s
- c. 70 ft/s
- d. -58 ft/s

e. -56 ft/s

ANS: B

PTS: 1

DIF: Medium

MSC: Multiple Choice

NOT: Section 2.1

19. Is there a number a such that $\lim_{x \rightarrow -3} \frac{6x^2 + ax + a + 2}{x^2 + x - 6}$ exists? If so, find the value of a and the value of the limit.

a. $a = 14$, limit equals 1.4

b. $a = 17$, limit equals 1.6

c. $a = 28$, limit equals 1.4

d. $a = 28$, limit equals 1.6

e. $a = 14$, limit equals 1.6

ANS: D

PTS: 1

DIF: Medium

MSC: Multiple Choice

NOT: Section 2.3

20. Evaluate the limit, if it exists.

$$\lim_{h \rightarrow 0} \frac{(x-h)^3 - x^3}{h}$$

a. 1

b. -3

c. $3x^2$

d. $-3x^2$

e. does not exist

ANS: D

PTS: 1

DIF: Medium

MSC: Multiple Choice

NOT: Section 2.3