

Larson_Calculus_10e ch02sec01

MULTIPLE CHOICE

1. Find the slope m of the line tangent to the graph of the function $f(x) = 2 - 7x$ at the point $(-1, 9)$.
- a. $m = -7$
 - b. $m = -2$
 - c. $m = 2$
 - d. $m = 7$
 - e. $m = -9$

ANS: A PTS: 1 DIF: Easy REF: Section 2.1
OBJ: Calculate the slope of a line tangent to the graph of a function at a specified point
MSC: Skill

2. Find the slope m of the line tangent to the graph of the function $g(x) = 9 - x^2$ at the point $(4, -7)$.
- a. $m = 4$
 - b. $m = 9$
 - c. $m = -8$
 - d. $m = -7$
 - e. $m = -18$

ANS: C PTS: 1 DIF: Medium REF: Section 2.1
OBJ: Calculate the slope of a line tangent to the graph of a function at a specified point
MSC: Skill

3. Find the derivative of the function $g(x) = -2$ by the limit process.
- a. $g'(x) = 2$
 - b. $g'(x) = 2x$
 - c. $g'(x) = -2x$
 - d. $g'(x) = 0$
 - e. $g'(x) = -2$

ANS: D PTS: 1 DIF: Easy REF: Section 2.1
OBJ: Calculate the derivative of a function by the limit process MSC: Skill

4. Find the derivative of the function $h(s) = 7 + \frac{6}{7}s$ by the limit process.

- a. $h'(s) = 7$
- b. $h'(s) = 7s + \frac{6}{7}s^2$
- c. $h'(s) = \frac{6}{7}$
- d. $h'(s) = \frac{55}{7}$
- e. $h'(s) = 7s + \frac{6}{7}$

ANS: C PTS: 1 DIF: Easy REF: Section 2.1
OBJ: Calculate the derivative of a function by the limit process MSC: Skill

5. Find the derivative of the following function $f(x) = -3x^2 + 6x - 8$ using the limiting process.

- a. $f'(x) = -6x + 6$
- b. $f'(x) = -3x + 6$
- c. $f'(x) = -6x + 6x - 8$
- d. $f'(x) = -3x - 6$
- e. $f'(x) = -6x - 6$

ANS: A PTS: 1 DIF: Easy REF: Section 2.1
OBJ: Calculate the derivative of a function by the limit process MSC: Skill

6. Find the derivative of the following function using the limiting process.

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

- a. -4
- b. $-4x + 5$
- c. $-8x - 5$
- d. $-8x$
- e. $-8x + 5$

ANS: E PTS: 1 DIF: Easy REF: Section 2.1
OBJ: Calculate the derivative of a function by the limit process MSC: Skill

7. Find the derivative of the following function using the limiting process.

$$f(x) = 3x^3 - 9x^2 - 8$$

- a. $f'(x) = 9x^2 + 18x$
- b. $f'(x) = 6x^2 - 18x$
- c. $f'(x) = 9x^2 - 18x - 8$
- d. $f'(x) = 6x^2 + 18x$
- e. $f'(x) = 9x^2 - 18x$

ANS: E PTS: 1 DIF: Medium REF: Section 2.1
OBJ: Calculate the derivative of a function by the limit process MSC: Skill

8. Find the derivative of the following function using the limiting process.

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

- a. $f'(x) = \frac{2}{(x+3)^2}$
- b. $f'(x) = -\frac{2x}{(x-3)^2}$

- c. $f'(x) = -\frac{2}{(x-3)^2}$
- d. $f'(x) = \frac{2}{(x-3)^2}$
- e. $f'(x) = -\frac{2}{(x+3)^2}$

ANS: C PTS: 1 DIF: Medium REF: Section 2.1
 OBJ: Calculate the derivative of a function by the limit process MSC: Skill

9. Find the derivative of the following function using the limiting process.

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

- a. $f'(x) = \frac{4}{x^5}$
- b. $f'(x) = -\frac{4}{x^3}$
- c. $f'(x) = \frac{4}{x^3}$
- d. $f'(x) = -\frac{5}{x^5}$
- e. $f'(x) = -\frac{4}{x^5}$

ANS: E PTS: 1 DIF: Medium REF: Section 2.1
 OBJ: Calculate the derivative of a function by the limit process MSC: Skill

10. Find the derivative of the function $f(x) = \sqrt{7x-3}$ using the limiting process.

- a. $f'(x) = \frac{7}{2\sqrt{7x-3}}$
- b. $f'(x) = -\frac{7}{2\sqrt{7x-3}}$
- c. $f'(x) = -\frac{7x}{\sqrt{7x-3}}$
- d. $f'(x) = \frac{7}{2}\sqrt{7x-3}$
- e. $f'(x) = -\frac{7}{\sqrt{7x-3}}$

ANS: A PTS: 1 DIF: Medium REF: Section 2.1
 OBJ: Calculate the derivative of a function by the limit process MSC: Skill

11. Find the derivative of the function $f(x) = \frac{20}{\sqrt{x}}$ by the limit process.

- a. $f'(x) = \frac{20}{x}$
- b. $f'(x) = -\frac{10\sqrt{x}}{x}$
- c. $f'(x) = \frac{10}{x}$
- d. $f'(x) = -\frac{10}{x\sqrt{x}}$
- e. $f'(x) = -\frac{20}{x\sqrt{x}}$

ANS: D PTS: 1 DIF: Difficult REF: Section 2.1
 OBJ: Calculate the derivative of a function by the limit process MSC: Skill

12. Find an equation of the tangent line to the graph of the function $f(x) = x^2 + 5x + 2$ at the point $(-5, 2)$.

- a. $y = -23$
- b. $y = -5x - 23$
- c. $y = 15x$
- d. $y = 5x$
- e. $y = -15x - 73$

ANS: B PTS: 1 DIF: Medium REF: Section 2.1
 OBJ: Write an equation of a line tangent to the graph of a function at a specified point
 MSC: Skill

13. Find an equation of the tangent line to the graph of the function $f(x) = \sqrt{x-2}$ at the point $(18, 4)$.

- a. $y = \frac{x}{4} + \frac{7}{2}$
- b. $y = \frac{x}{8} + \frac{7}{4}$
- c. $y = \frac{x}{8} + \frac{9}{2}$
- d. $y = \frac{x}{4} + \frac{9}{2}$
- e. $y = \frac{x}{8} + \frac{9}{4}$

ANS: B PTS: 1 DIF: Medium REF: Section 2.1
 OBJ: Write an equation of a line tangent to the graph of a function at a specified point
 MSC: Skill

14. Find an equation of the line that is tangent to the graph of the function $f(x) = 8x^2$ and parallel to the line $16x + y + 6 = 0$.

- a. $16x + y + 8 = 0$
- b. $12x - y + 6 = 0$

- c. $16x - y + 8 = 0$
- d. $16x + y + 6 = 0$
- e. $12x + y + 6 = 0$

ANS: A PTS: 1 DIF: Medium REF: Section 2.1
 OBJ: Write an equation of a line tangent to the graph of a function that is parallel to a given line
 MSC: Skill

15. Find an equation of the line that is tangent to the graph of f and parallel to the given line.

$$f(x) = 3x^3, \quad 9x - y + 9 = 0$$

- a. $y = -9x + 6$
- b. $y = -3x + 6$
- c. $y = 9x - 3$ and $y = 9x + 3$
- d. $y = -9x - 6$
- e. $y = 9x - 6$ and $y = 9x + 6$

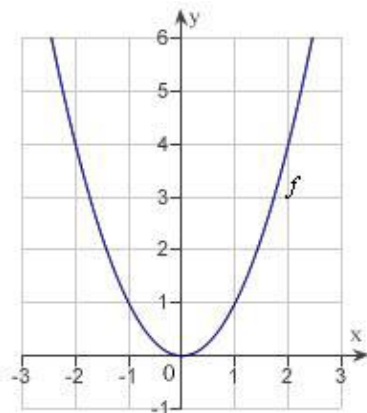
ANS: E PTS: 1 DIF: Medium REF: Section 2.1
 OBJ: Write an equation of a line tangent to the graph of a function that is parallel to a given line
 MSC: Skill

16. Find an equation of the line that is tangent to the graph of the function $f(x) = \frac{7}{\sqrt{x}}$ and parallel to the line $7x + 2y - 18 = 0$.

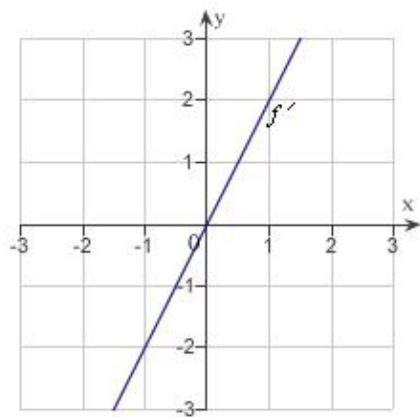
- a. $7x + y + 21 = 0$
- b. $9x + y - 18 = 0$
- c. $9x + 2y + 9 = 0$
- d. $7x + 2y - 21 = 0$
- e. $7x + 2y - 14 = 0$

ANS: D PTS: 1 DIF: Medium REF: Section 2.1
 OBJ: Write an equation of a line tangent to the graph of a function that is parallel to a given line
 MSC: Skill

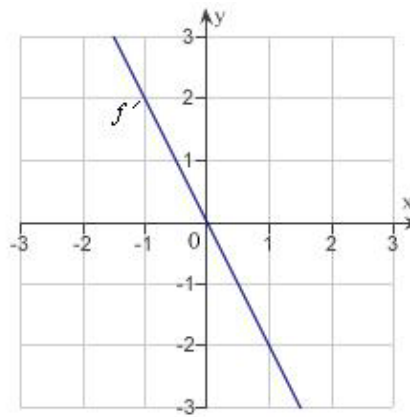
17. The graph of the function f is given below. Select the graph of f' .



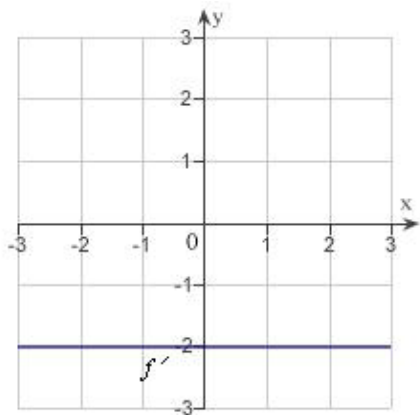
a.



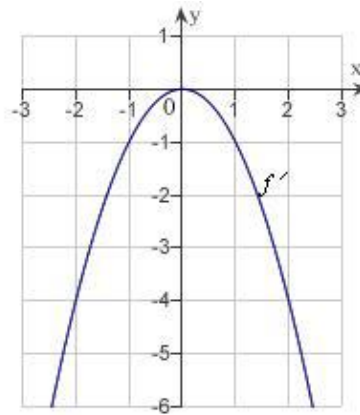
d.



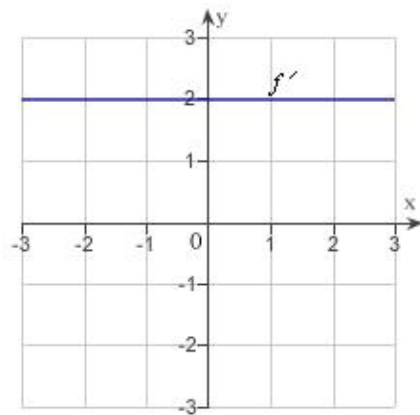
b.



e.



c.



ANS: A

PTS: 1

DIF: Medium

REF: Section 2.1

OBJ: Identify the graph of f' using the given graph of f

MSC: Skill

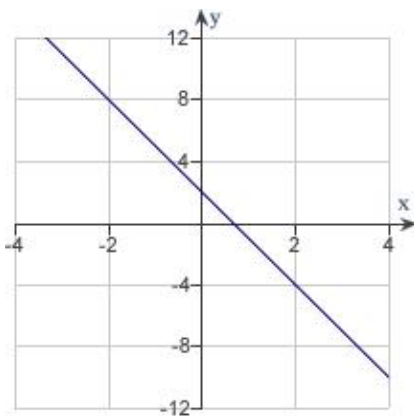
18. Identify the graph which has the following characteristics.

$$f(0) = -2$$

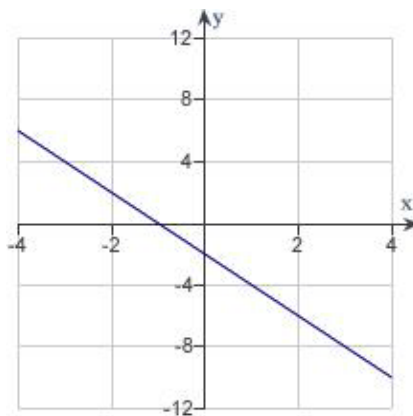
$$f'(x) = 2, -\infty < x < \infty$$

Graph 1

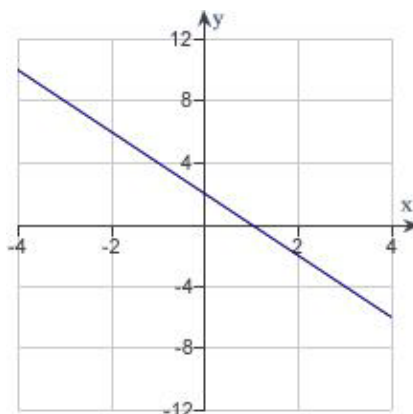
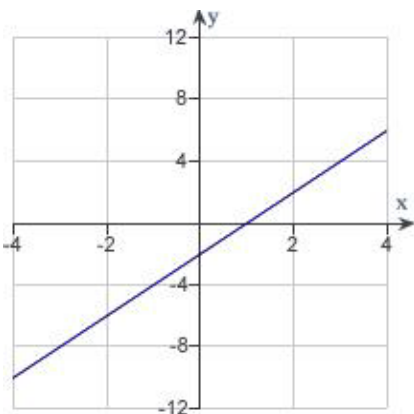
Graph 2



Graph 3



Graph 4



- a. Graph 2
- b. Graph 3
- c. Graph 1
- d. Graph 4
- e. none of the above

ANS: B

PTS: 1

DIF: Easy

REF: Section 2.1

OBJ: Identify the graph of a function given information about the function and its derivative

MSC: Skill

19. Use the alternative form of the derivative to find the derivative of the function $f(x) = x^2 - 9$ at $x = 5$.

- a. $f'(5) = 1$
- b. $f'(5) = 250$
- c. $f'(5) = 2$
- d. $f'(5) = 125$
- e. $f'(5) = 10$

ANS: E

PTS: 1

DIF: Easy

REF: Section 2.1

OBJ: Calculate the derivative of a function at a specified point using the alternative form

MSC: Skill

20. Use the alternative form of the derivative to find the derivative of the function $f(x) = \frac{3}{x^2}$ at $x = 2$.

- a. $f'(2) = \frac{3}{4}$
- b. $f'(2) = -\frac{3}{4}$
- c. $f'(2) = \frac{3}{8}$
- d. $f'(2) = -\frac{3}{2}$
- e. $f'(2) = -\frac{9}{16}$

ANS: B

PTS: 1

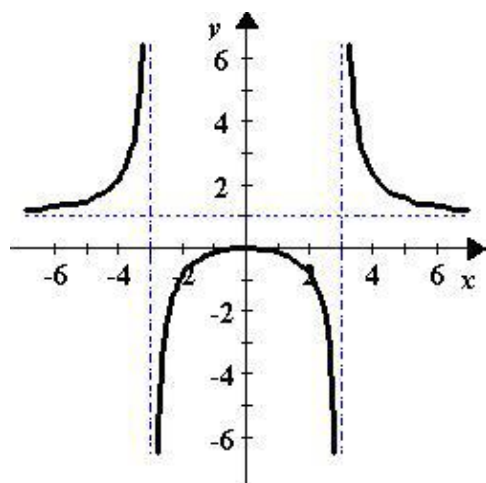
DIF: Medium

REF: Section 2.1

OBJ: Calculate the derivative of a function at a specified point using the alternative form

MSC: Skill

21. Describe the x -values at which the graph of the function $f(x) = \frac{x^2}{x^2 - 9}$ given below is differentiable.



- a. $f(x)$ is differentiable at $x = \pm 3$.
- b. $f(x)$ is differentiable everywhere except at $x = \pm 3$.
- c. $f(x)$ is differentiable everywhere except at $x = 0$.
- d. $f(x)$ is differentiable on the interval $(-2, 2)$.
- e. $f(x)$ is differentiable on the interval $(2, \infty)$.

ANS: B

PTS: 1

DIF: Medium

REF: Section 2.1

OBJ: Identify the x -value (or values) at which a function is differential

MSC: Skill