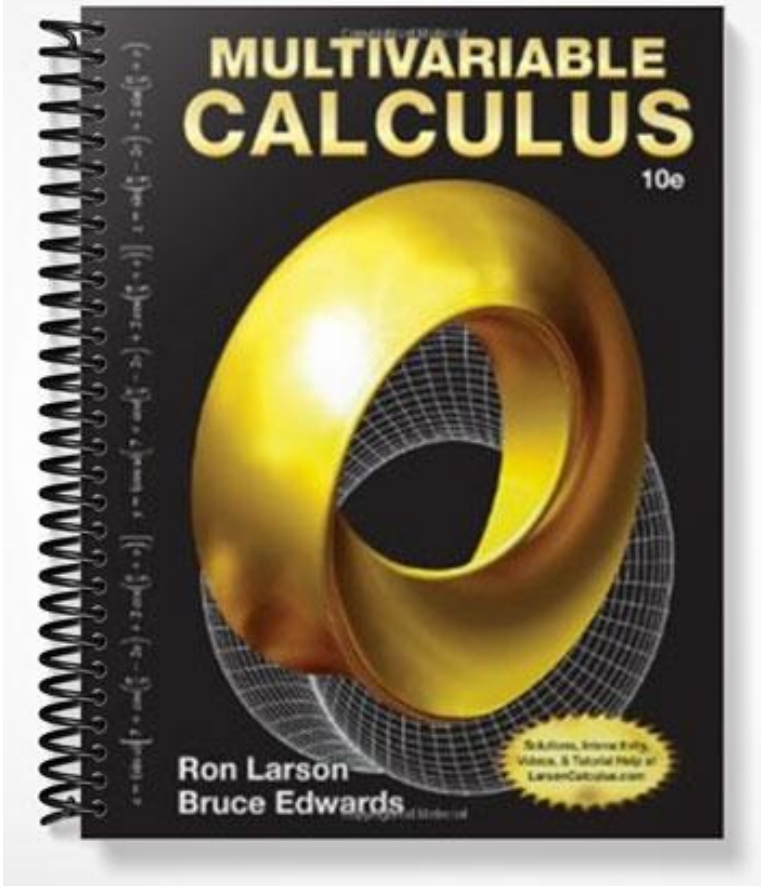
TEST BANK



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.

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

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

c. $f'(x) = -\dfrac{2}{(x-3)^2}$

d. $f'(x) = \dfrac{2}{(x-3)^2}$

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

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.

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

a. $f'(x) = \dfrac{4}{x^5}$

b. $f'(x) = -\dfrac{4}{x^3}$

c. $f'(x) = \dfrac{4}{x^3}$

d. $f'(x) = -\dfrac{5}{x^5}$

e. $f'(x) = -\dfrac{4}{x^5}$

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. $f'(x) = \dfrac{7}{2\sqrt{7x-3}}$

b. $f'(x) = -\dfrac{7}{2\sqrt{7x-3}}$

c. $f'(x) = -\dfrac{7x}{\sqrt{7x-3}}$

d. $f'(x) = \dfrac{7}{2}\sqrt{7x-3}$

e. $f'(x) = -\dfrac{7}{\sqrt{7x-3}}$

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 $f(x) = \dfrac{20}{\sqrt{x}}$ 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.

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

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 $y = 9x + 6$

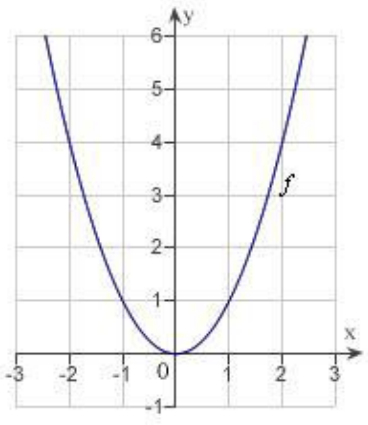
ANS: E PTS: 1 DIF: Medium REF: Section 2.1
OBJ: Write an equation of a line tangent to the graph of a function that is parallel to a given line
MSC: Skill

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

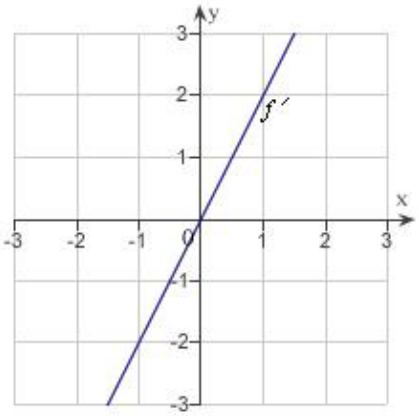
a. $7x + y + 21 = 0$
b. $9x + y - 18 = 0$
c. $9x + 2y + 9 = 0$
d. $7x + 2y - 21 = 0$
e. $7x + 2y - 14 = 0$

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.



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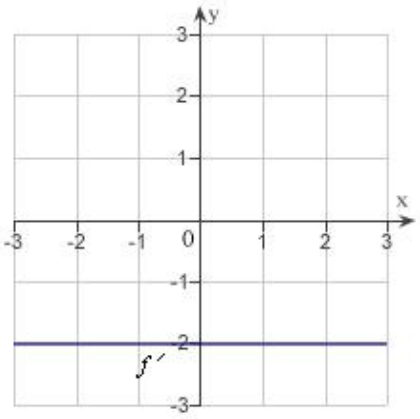
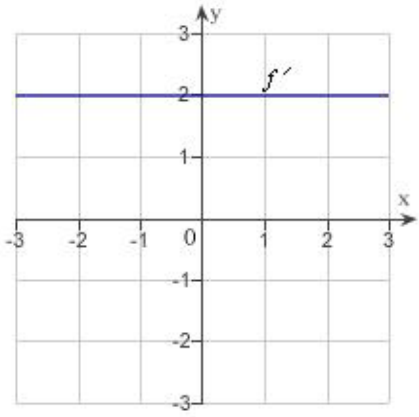
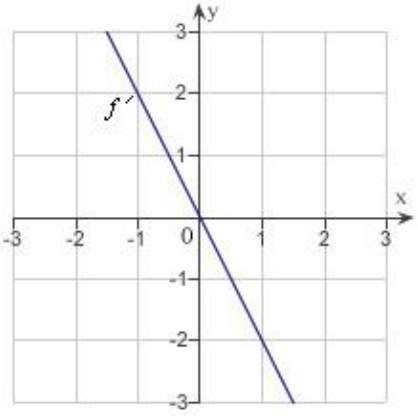


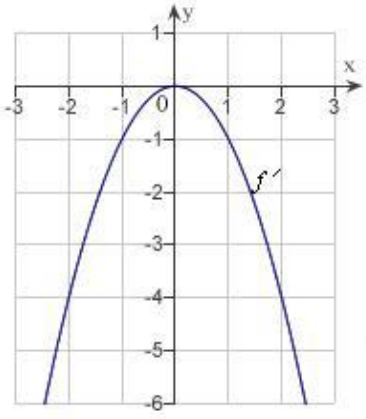
c.



d.



e.



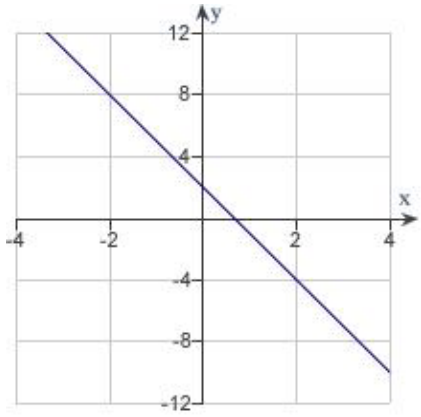
ANS: A PTS: 1 DIF: Medium REF: Section 2.1
OBJ: Identify the graph of f' using the given graph of f MSC: Skill

18. Identify the graph which has the following characteristics.

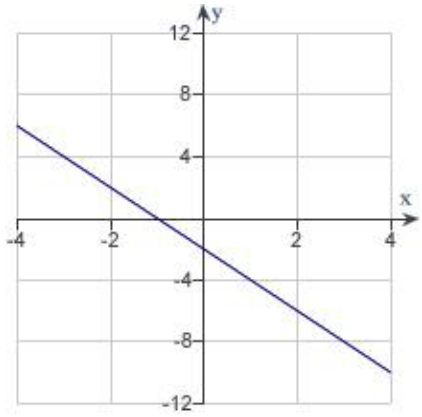
$f(0) = -2$

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

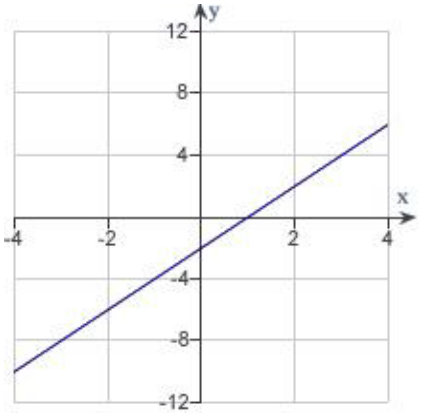
Graph 1 Graph 2

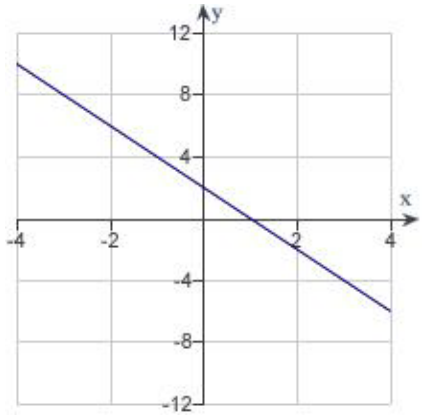


Graph 3



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. $f'(2) = -\frac{3}{4}$

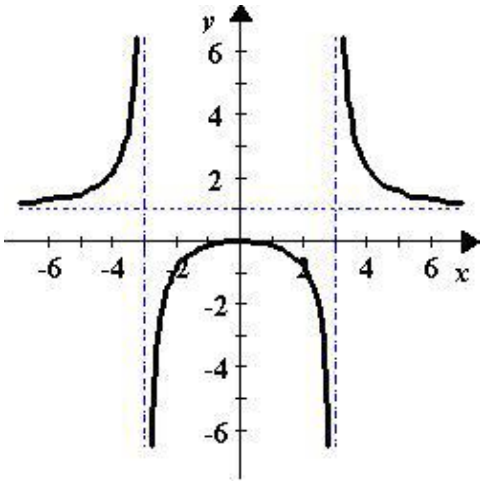
c. $f'(2) = \frac{3}{8}$

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