In problems 1, 2, and 3 find an equation of the straight line satisfying the given conditions:

- 1. Through the point (-1, 4) and parallel to the y-axis.

- a. x = -1 b. x = 4 c. y = -1 d. y = 4 e. y 4 = -1(x + 1)

- 2. Through the point (0, -2) and perpendicular to the straight line y = x.
- a. y = -x + 2 b. y + 2 = x c. x + y = -2

- d. y = -2x + 1 e. y = 1(x + 2)

- 3. With slope -3 and y-intercept (0, -1).
- a. -3x + y = -1 b. 3x y = -1 c. y = -3x + 1

- d. y = -3x 1 e. y = -3(x + 1)

- 4. Let $f(x) = x^2 + x 6$. Find an equation of the tangent line to the graph of f(x) at the point (1,f(1)).
- a. x + 4y = -15 b. 3x y = 0 c. 3x y = 7

- d. 2x y = -6 e. 3x + y = -1

- 5. The domain of $f(x) = \sqrt{x-1}$ is the set of numbers
- a. $(-\infty, \infty)$ b. $(-\infty, 1)$

c. (-∞, 1]

- d. $(1, \infty)$
- e. [1, ∞)

- 6. Consider the function $f(x) = \frac{1}{(x-1)^2}$. The value $f(\frac{2}{c} + 1)$ is
- a. $\frac{c^2}{4} + 1$

- b. $\frac{4}{c^2}$ c. $\frac{c^2}{4} + 1$
- d. $\frac{c^2}{4}$

e. $\frac{1}{c^2+2c+4}$

- Suppose we are to use the secant-line method to obtain f'(x),. the derivative of a function f(x). We select the point (x,f(x)) on the graph of f(x) where the tangent line touches the graph. A secant line is drawn through the point and through a second point (x+h,f(x+h)) on the graph. The only specific information about the function we are given is that the difference f(x + h) - f(x) between the y-coordinates of these two points is $3x^2 h + 3xh^2 + h^3 + 2h$. Find f'(x).
- a. $3x^2$
- **d**. 0
- b. $3x^2 + 7$
 - e. $3x^2 + 5$

- 8. Let $f(x) = \sqrt{x+2}$ and $g(x) = x^4 4$. Find the composition function g(f(x)).
- a. $x^2 + 4x$ b. $\sqrt{x^4 2}$ c. x 2

 $c \frac{4}{9}$

c. $3x^2 + 2$

- d. $(x^4 4)\sqrt{x + 2}$
- e. $\sqrt{x+2} 4$

- 9. Simplify $\left(\frac{27}{8}\right)^{\frac{2}{3}}$.
- a. $\frac{3}{2}$

- d. $\frac{2}{3}$

10. The parabola $y = x^2 - 4x + 4$ and the line y = 2x - 1 intersect in two points. Find the y-coordinates of these points.

a. 1 and 9

b. 4 and 7

c. 2 and 3

d. 3 and 5

e. -1 and -3

11. The quadratic equation $x^2 + 2x + C = 0$ has no real number as a solution precisely for the following values of C.

a. C = 1 b. C < 1 c. C > 1 d. for no C e. for all C

12. A curve in the xy - plane is the graph of a function if and only if each vertical line touches the curve how many times?

a. once

b. no more than once c. any number of

times

d. no more than twice, as long as these points are on the same vertical line

e. only a finite number of times

13. One of the following is not a rational function. Which one?

a.
$$\frac{12}{x}$$

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 b. $\frac{x^2 - 3x + 1}{1}$ c. $\frac{x^2 - 3x + 1}{x}$

c.
$$\frac{x^2 - 3x + 1}{x}$$

d.
$$\frac{x}{x^2 - 3x + 1}$$
 e. $\frac{\frac{1}{2}}{1}$

e.
$$\frac{x^{\frac{1}{2}} + 5}{1}$$

- 14. Compute $\lim_{x \varnothing 2} \frac{x^2 x 2}{x 2}$.
- a. Doesn't exist b. 2 c. 0
- d. 3
 - e. 4

- 15. Compute $\lim_{X \varnothing \bullet} \frac{x^2 1}{3 x^2}$.
- a. Doesn't exist b. -1 c. $\frac{-1}{3}$ d. -3 e. 1

16. The cost of manufacturing x units of a commodity is given by the cost function $C(x) = 3x^2 + \sqrt{x+5} + 1,000$. Find C'(x).

a.
$$6x + \frac{1}{2\sqrt{x+5}}$$
 b. $6x + \frac{1}{\sqrt{x+5}}$ c. $3x + \frac{1}{\sqrt{x+5}}$

b.
$$6x + \frac{1}{\sqrt{x+5}}$$

c.
$$3x + \frac{1}{\sqrt{x+5}}$$

d.
$$2x + \frac{1}{\sqrt{x+5}}$$
 e. $6x + \frac{1}{3\sqrt{x+5}}$

e.
$$6x + \frac{1}{3\sqrt{x+5}}$$

17. For $y = (1 - 3x)^{10}$, what is $\frac{dy}{dx}$?

a.
$$10(1 - 3x)^9$$

a.
$$10(1 - 3x)^9$$
 b. $30(1 - 3x)^9$ c. $-30(1 - 3x)^9$

c.
$$-30(1-3x)^9$$

d.
$$-3^9$$
 e. $(1-3x)^9$ (-3)

- 18. Let $f(x) = (2x 1)^{\frac{1}{3}}$. Find the slope of the curve y = f(x) at the point (1,1).

- a. 1 b. 2 c. $\frac{1}{2}$ d. $\frac{1}{3}$ e. $\frac{2}{3}$