

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.  $(-\infty, 1]$

d.  $(1, \infty)$

e.  $[1, \infty)$

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

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

b.  $\frac{4}{c^2}$

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

d.  $\frac{c^2}{4}$

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



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.  $\frac{12}{x}$

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

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

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

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

14. Compute  $\lim_{x \rightarrow 2} \frac{x^2 - x - 2}{x - 2}$ .

a. Doesn't exist

b. 2

c. 0

d. 3

e. 4

15. Compute  $\lim_{x \rightarrow 3} \frac{x^2 - 1}{3 - x^2}$ .

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

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

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

a.  $10(1 - 3x)^9$       b.  $30(1 - 3x)^9$       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.  $\frac{2}{3}$