

### 1.3: Lines and slopes

1. The equation of the line that passes through the center of the circle  $(x - 1)^2 + (y + 2)^2 = 5$ , and parallel to the line  $y = 3x - 11$ , is

A)  $3x - y - 5 = 0$

B)  $3x - y + 5 = 0$

C)  $x - 3y - 5 = 0$

D)  $x + 3y - 5 = 0$

E)  $3x + y + 5 = 0$

2. The equation of the line that passes through the point  $(-1, -2)$  and perpendicular to a line with undefined slope is

A)  $y = -2$

B)  $x = -1$

C)  $y = -1$

D)  $x = -2$

E)  $x + y = -2$

3. The line with  $x$ -intercept  $\frac{1}{2}$  and parallel to the line  $2x + 3y + 4 = 0$ , is

A)  $2x + 3y - 1 = 0$

B)  $2x + 3y + 6 = 0$

C)  $2x + 3y + 2 = 0$

D)  $2x + 3y = 0$

E)  $2x + 3y + 1 = 0$

4. Let  $k > 0$ . If the line through the points  $(-5, -3)$  and  $(-3, k)$  is perpendicular to the line  $kx + (2k + 3)y = 5$ , then  $k =$

A) 3

B) 1

C) 4

D) 2

E) 5

5. If  $ax + by + c = 0$  is the equation of the line that passes through the point  $(-1, 4)$  and parallel to the line  $3x + 2y - 6 = 0$ , then  $(a \cdot b) + c =$

A) 1

B) 8

C) -3

D) -11

E) -20

6. If slope of the line passing through the points  $(k, -3)$  and  $(-\frac{1}{2}, -2k)$  is  $\frac{2}{3}$ , then  $4k =$

A) 10

B) 5

C) -10

D) -5

E) 8

7. In the adjacent figure, if  $Ax - By = -36$  represents the equation of LINE 1 that is tangent to the circle  $(x + \frac{1}{3})^2 + (y + \frac{1}{4})^2 = 3$ , then  $A + B =$

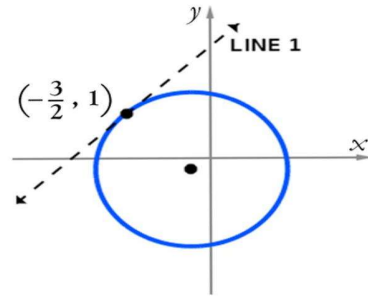
A) 29

B) -1

C) 1

D) 24

E) 36



8. The equation of the line passing through  $(-3, -5)$  and perpendicular to a line with zero slope is

A)  $x = -3$

B)  $y = -5$

C)  $y = 5$

D)  $x = \frac{1}{3}$

E)  $y = \frac{1}{5}$

9. The equation of the line that is passing through  $(2, -4)$  and perpendicular to the line  $3x - 2y = 5$ , is

A)  $3y + 2x = -8$

B)  $2y + 3x = -2$

C)  $3y + 2x = -2$

D)  $2y - 3x = -14$

E)  $y + 2x = 0$

10. If the line  $kx + 4y = 24$  and  $y = -\frac{3}{k+1}x + \frac{15}{4}$  are parallel, then the set of values of  $k$  consists of:

A) one positive and one negative integer.

B) two positive integers

C) two positive integers

D) one positive integer only

E) one negative integer only

11. A point that lies on the line that is perpendicular to the line  $y - 2x - 1 = 0$  and passes through the point  $(1, 3)$  is

- A)  $(2, 5/2)$
- B)  $(1, 4)$
- C)  $(0, 1)$
- D)  $(-1, 3)$
- E)  $(-2, 7/2)$

12. The  $y$ -intercept of the line passing through the point  $(2, 4)$  and perpendicular to the line  $2x + 6y = -5$  is:

- A)  $-2$
- B)  $2$
- C)  $-1/2$
- D)  $1/2$
- E)  $3$

13. Let  $A(-6, -4)$ ,  $B(0, -2)$ , and  $C(m, 8)$  be the vertices of a right triangle, where the right angle is at  $A$ . The value of  $m$  is

A)  $-10$

B)  $4$

C)  $-8$

D)  $-4$

E)  $6$

14. The equation of the horizontal line through  $(\sqrt{2}, -\sqrt{3})$  is

A)  $y + \sqrt{3} = 0$

B)  $x = -\sqrt{3}$

C)  $y = \sqrt{2}$

D)  $x - \sqrt{2} = 0$

E)  $\sqrt{2}x - \sqrt{3}y = 0$

15. The equation of the Vertical line through  $(\sqrt{2}, -\sqrt{3})$  is

A)  $y + \sqrt{3} = 0$

B)  $x = -\sqrt{3}$

C)  $y = \sqrt{2}$

D)  $x - \sqrt{2} = 0$

E)  $\sqrt{2}x - \sqrt{3}y = 0$

16. The  $y$ -intercept of the line that passes through the points  $(\frac{3}{4}, 2)$  and

$(\frac{1}{8}, -\frac{1}{2})$  is equal to

A)  $(0, -1)$



17. The equation of a line through the point  $(2, -10)$  and perpendicular to a line with undefined slope is

A)  $y = -10$

18. Which one of the following statements is FALSE?

A)  $y = 5$  is an equation of a vertical line.

B) The slope of the line passing through the points  $(-1, -5)$  and  $(-5, -1)$  is  $-1$ .

C) A line with a negative slope falls from left to right.

D) The slope of a horizontal line is zero.

E) If the slope is positive, then the line is increasing.

19. If the line passing through the points  $(2,6)$  and  $(-4, k)$  is parallel to the line  $2x - 3y = 4$ , then  $k$  is equal to

A) 2

20. Which one of the following statements is TRUE:

A) The slope of the horizontal line passing through the point  $(2, -1)$  is 0.

B) The slope of the line  $x = \frac{4}{3}$  is  $\frac{4}{3}$ .

C) The slope of the line  $2y + 3x = \frac{4}{3}$  is  $\frac{3}{2}$ .

D) The slope of the vertical line passing through the point  $(-3, 2)$  is 2.

E) The slope of the line  $y = 0$  is undefined.

21. If the line passing through the points  $(-1, 4)$  and  $(-4, k)$  is parallel to the line  $x + 3y = 5$ , then  $k$  is equal to:

A) 5

22. The  $y$ -intercept of the line with  $x$ -intercept  $-2$  and parallel to the line  $3x + 4y = 5$  is

A)  $-\frac{3}{2}$

23. If the line  $ky - 5x = 1$  is perpendicular to the line passing through the points  $(4, -1)$  and  $(-\frac{7}{2}, 2)$  then  $k$  is equal to:

A) 2

24. If the three points  $(a, -3)$ ,  $(-4, 1)$  and  $(a - 3, -1)$  are collinear, then  $5a - 4 =$

A) 6

25. If the line through the points  $(-k, 5)$  and  $(3, k + 1)$  is perpendicular to the line  $2x + 3 = 0$ , then  $k =$

A) 4

26. The equation of the line with slope  $-2$  and passing through the points  $(-1, p)$  and  $(2, 3p)$ , is

A)  $2x + y + 5 = 0$

B)  $2x + y + 7 = 0$

C)  $x + 2y + 5 = 0$

D)  $2x + y - 5 = 0$

E)  $x - 2y - 5 = 0$

27. If  $(0, b)$  is the  $y$ -intercept of the line that is perpendicular to the line  $2x + 3y - 5 = 0$  and passes through the point  $(2, -1)$ , then  $b =$

A) 4

B) -4

28. If  $a$  and  $b$  are nonzero real numbers such that the line  $ax + y = b$  is perpendicular to the line  $cx + y = b + 2$ , then  $ac =$

A) -1

29. If the line  $ax + by + \frac{5}{2} = 0$  with the  $y$ -intercept  $-\frac{5}{6}$  is parallel to the line  $2x + 3y = 16$ , then  $a + b =$

A) 5

B) -5

C) -10

D) -8

E) 10

30. A local diner must build a wheelchair ramp to provide handicap access to the restaurant. Federal building codes require that a wheelchair ramp must have a maximum rise of 1 inch for every horizontal distance of 12 inches. If the space available to build a ramp is 120 inches wide, then the ramp reaches a height of

A) 10 inches

B) 12 inches

C) 120 inches

D) 100 inches

E) 0.1 inches