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 $\left(-\frac{1}{2}, -2k\right)$ 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 $\left(x + \frac{1}{3}\right)^2 + \left(y + \frac{1}{4}\right)^2 = 3$, then
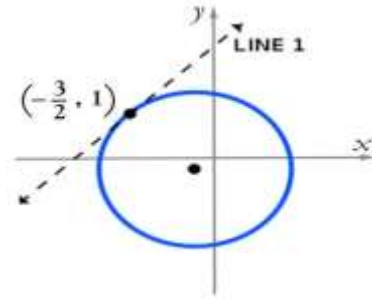
$A + B =$

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 $\left(\frac{3}{4}, 2\right)$ and $\left(\frac{1}{8}, -\frac{1}{2}\right)$ 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 $\left(-\frac{7}{2}, 2\right)$ 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 $k =$

<mark>A) 4</mark>

26. The equation of the line with slope -2 and passing through the points

$(-1, p)$ and $(2, 3p)$, is

<mark>A) $2x + y + 5 = 0$</mark>

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

31. In the adjacent figure, if line L_1 is perpendicular to line L_2, then the y-intercept of L_2, is equal to

A) $-\dfrac{13}{3}$

B) $-\dfrac{16}{3}$

C) $-\dfrac{9}{2}$

D) -4

E) -3