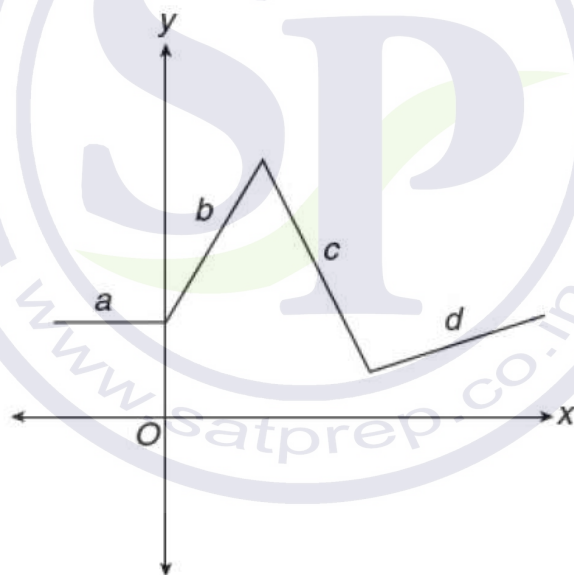
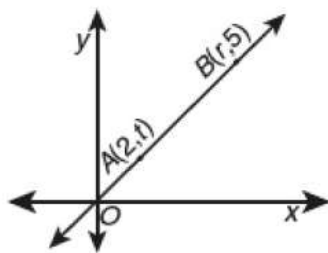


1. A family kept a log of the distance they traveled during a trip, as represented by the graph above in which the points are ordered pairs of the form (hour, distance). During which interval was their average speed the greatest?
- (A) The first hour to the second hour  
 (B) The second hour to the fourth hour  
 (C) The sixth hour to the eighth hour  
 (D) The eighth hour to the tenth hour



2. In the above figure, each line segment is labeled with a variable that represents the numerical value of its slope. Which inequality statement must be true?
- (A)  $a < c < b < d$   
 (B)  $d < b < a < c$   
 (C)  $d < c < b < a$   
 (D)  $c < a < d < b$
3. Which of the following represents an equation of the line that is the perpendicular bisector of the segment whose endpoints are  $(-2, 4)$  and  $(8, 4)$ ?
- (A)  $x = 3$

- (B)  $y = 3$
- (C)  $x = 5$
- (D)  $y = 5$



4. In the graph above, what is  $r$  in terms of  $t$ ?

- (A)  $\frac{5}{2}t$
- (B)  $\frac{2}{5}t$
- (C)  $\frac{t}{10}$
- (D)  $\frac{10}{t}$

5. What is the slope of the line  $2(x + 2y) = 0$ ?

- (A)  $\frac{1}{2}$
- (B)  $-2$
- (C)  $-\frac{1}{2}$
- (D)  $0$

6. Segments  $AP$  and  $BP$  have the same length. If the coordinates of  $A$  and  $P$  are  $(-1, 0)$  and  $(4, 12)$ , respectively, which could be the coordinates of  $B$ ?

- I.  $(\frac{3}{2}, 6)$
- II.  $(9, 24)$
- III.  $(-8, 7)$

- (A) I and II only
- (B) II and III only
- (C) II only
- (D) III only

7. Which of the following is an equation of a line that is parallel to the line  $\frac{1}{2}y - \frac{2}{3}x = 6$  in the  $xy$ -plane?

- (A)  $y = -\frac{3}{4}x + 1$
- (B)  $y = 4\left(\frac{x-1}{3}\right)$
- (C)  $9x - 6y = 18$
- (D)  $\frac{y}{3} = \frac{x-5}{4}$

8. Which of the following is an equation of a line that is perpendicular to the line  $y = -2(x + 1)$ ?

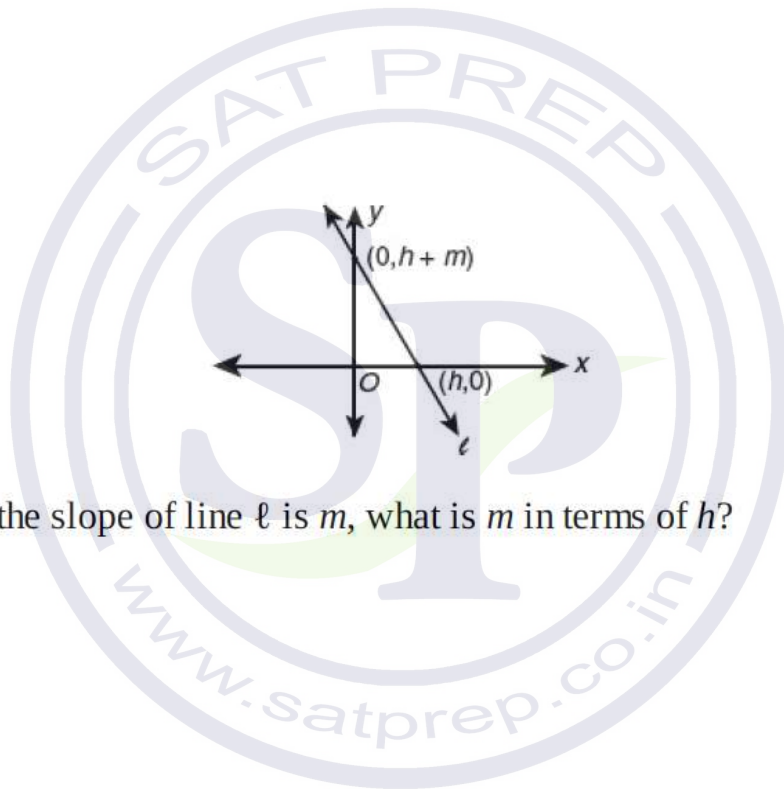
- (A)  $x + 2y = 7$
- (B)  $8x - 4y = 9$
- (C)  $\frac{x-1}{6} = \frac{y}{3}$
- (D)  $y - 2x = 0$

9. The point whose coordinates are  $(4, -2)$  lies on a line whose slope is  $\frac{3}{2}$ . Which of the following are the coordinates of another point on this line?

- (A)  $(1, 0)$
- (B)  $(2, 1)$
- (C)  $(6, 1)$
- (D)  $(7, 0)$

10. If point  $E(5, h)$  is on the line that contains  $A(0, 1)$  and  $B(-2, -1)$ , what is the value of  $h$ ?

- (A)  $-1$
- (B)  $0$
- (C)  $1$
- (D)  $6$



11. In the figure above, if the slope of line  $\ell$  is  $m$ , what is  $m$  in terms of  $h$ ?

- (A)  $\frac{h}{1+h}$
- (B)  $\frac{-h}{1+h}$
- (C)  $\frac{h}{1-h}$
- (D)  $1+h$

12. Which could be the slope of a line that contains  $(1, 1)$  and passes between the points  $(0, 2)$  and  $(0, 3)$ ?

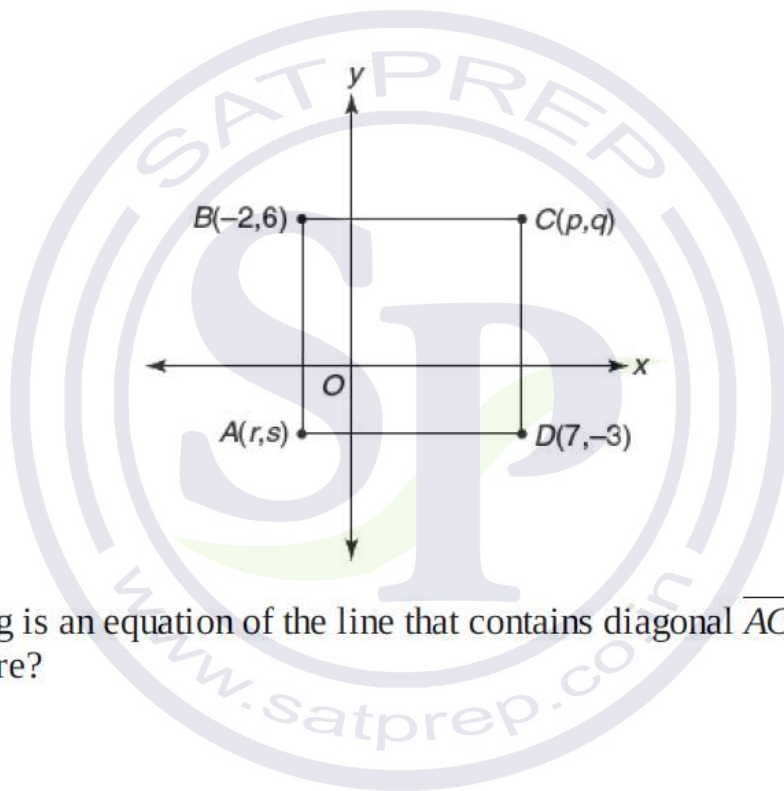
- (A)  $\frac{3}{2}$
- (B)  $\frac{1}{2}$
- (C)  $0$
- (D)  $\frac{1}{2}$

13. The line  $y + 2x = b$  is perpendicular to a line that passes through the origin. If the two lines intersect at the point  $(k + 2, 2k)$ , what is the value of  $k$ ?

- (A)  $-\frac{3}{2}$
- (B)  $-\frac{2}{3}$
- (C)  $\frac{2}{5}$
- (D)  $\frac{2}{3}$

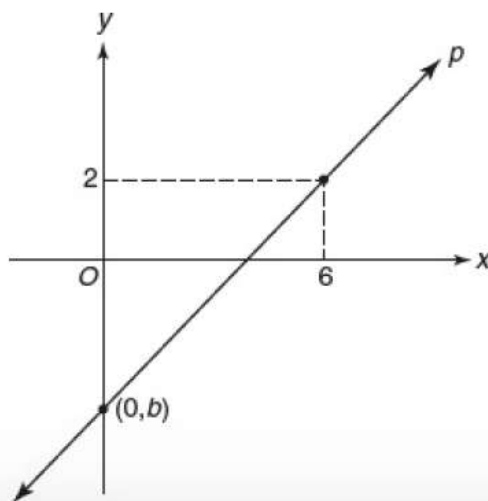
14. Which of the following is an equation of the line that is parallel to the line  $y - 4x = 0$  and has the same  $y$ -intercept as the line  $y + 3 = x + 1$ ?

- (A)  $y = 4x - 2$
- (B)  $y = 4x + 1$
- (C)  $y = -\frac{1}{4}x + 1$
- (D)  $y = -\frac{1}{4}x - 2$



15. Which of the following is an equation of the line that contains diagonal  $\overline{AC}$  of square  $ABCD$  shown in the accompanying figure?

- (A)  $y = 2x + 1$
- (B)  $y = -x + 1$
- (C)  $y = \frac{1}{2}x - 2$
- (D)  $y = x - 1$



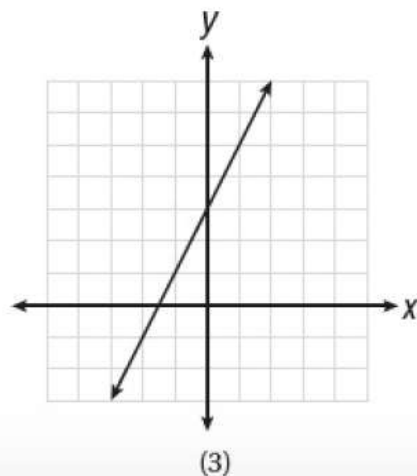
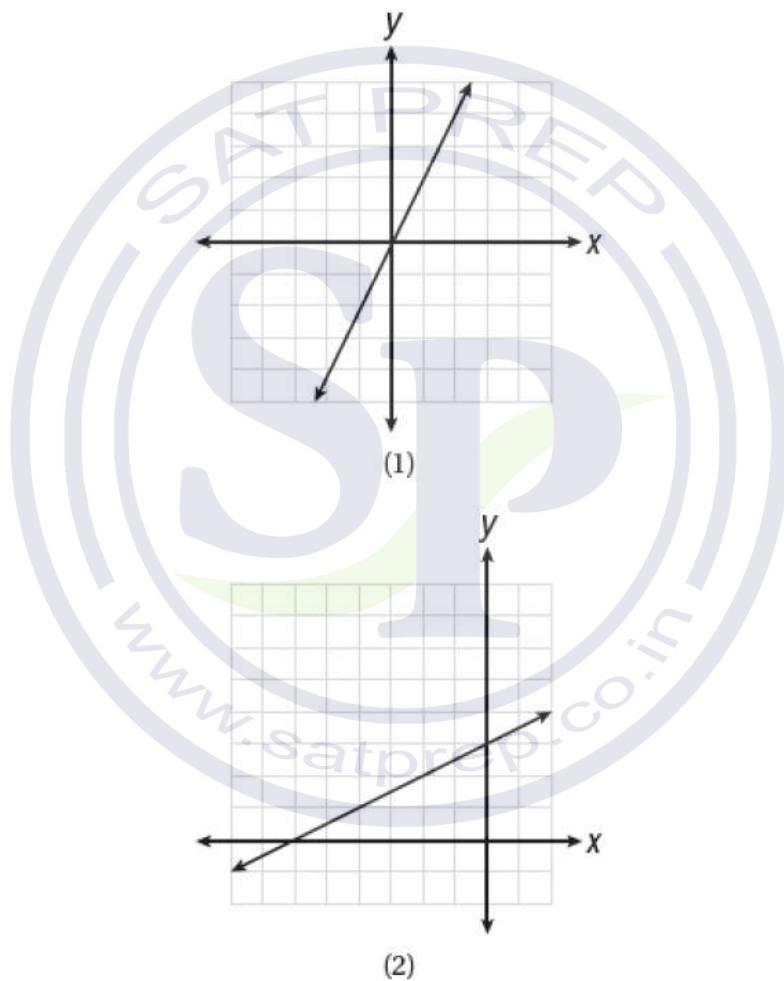
Note: Figure not drawn to scale.

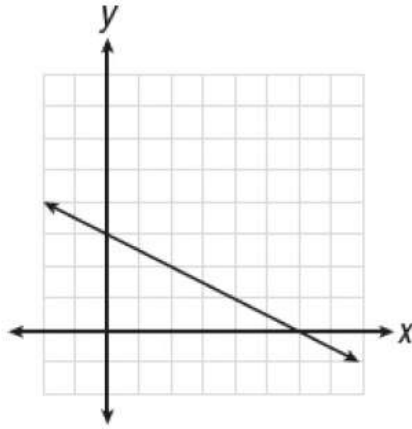
16. If the slope of line  $p$  shown in the figure above is  $\frac{3}{2}$ , what is the value of  $b$ ?

- (A) -8
- (B) -7
- (C) -5
- (D) -3

17. Which of the following graphs shows a line where each value of  $y$  is three more than half of  $x$ ?

- (A) Graph (1)
- (B) Graph (2)
- (C) Graph (3)
- (D) Graph (4)

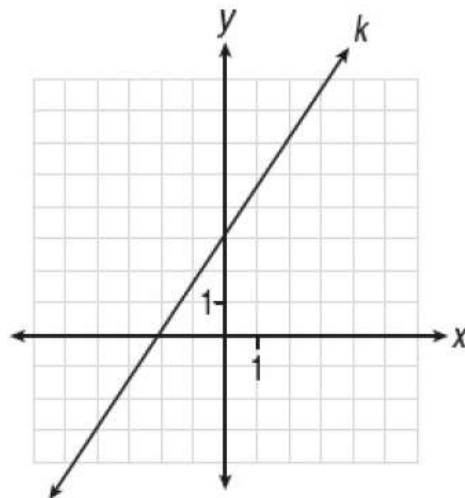




(4)

Number of Hours, $h$	Dollars Earned, $d$
8	\$70.00
15	\$113.75
19	\$138.75
30	\$207.50

18. The table above represents the number of hours a student worked and the amount of money the student earned. Which equation represents the number of dollars,  $d$ , earned in terms of the number of hours,  $h$ , worked
- (A)  $d = 6.25h$   
 (B)  $d = 6.25h + 20$   
 (C)  $d = 5.25h + 28$   
 (D)  $d = 7h + 8.75$
19. The lines  $y = ax + b$  and  $y = bx + a$  are graphed in the  $xy$ -plane. If  $a$  and  $b$  are non-zero constants and  $a + b = 0$ , which statement must be true?
- (A) The lines are parallel.  
 (B) The lines intersect at right angles.  
 (C) The lines have the same  $x$ -intercept.  
 (D) The lines have the same  $y$ -intercept.



20. Which of the following is an equation of the line in the  $xy$ -plane that is perpendicular to line  $k$  in the

figure above?

(A)  $y = 3\left(1 - \frac{1}{2}x\right)$

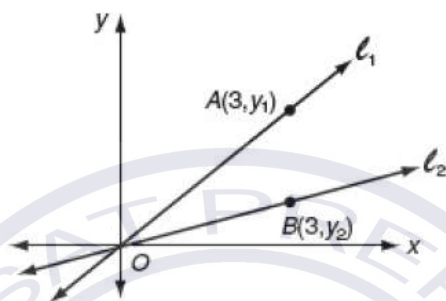
(B)  $\frac{x}{y} = \frac{2}{3}$

(C)  $3y + 2x = 4$

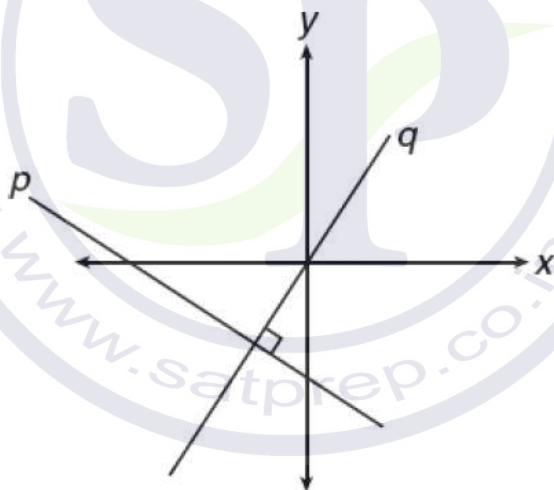
(D)  $2y + 3x = -6$

## Grid-In

1. A line with a slope of  $\frac{3}{14}$  passes through points  $(7, 3k)$  and  $(0, k)$ . What is the value of  $k$ ?

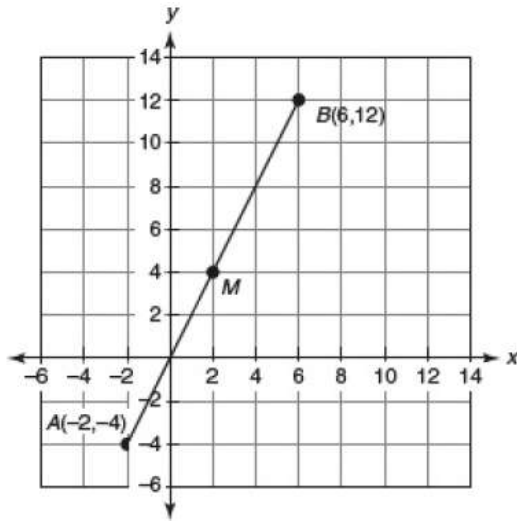


2. In the figure above, the slope of line  $l_1$  is  $\frac{5}{6}$  and the slope of line  $l_2$  is  $\frac{1}{3}$ . What is the distance from point A to point B?



Note: Figure not drawn to scale.

3. In the figure above, lines  $p$  and  $q$  are perpendicular. Line  $q$  passes through the origin and intersects line  $p$  at  $(-1, -2)$ . If  $(-20, k)$  is a point on line  $p$ , what is the value of  $k$ ?



- In the accompanying figure, what is the  $y$ -coordinate of the point at which the line that is perpendicular to  $AB$  (not shown) at point  $M$  crosses the  $y$ -axis?
- A line in the  $xy$ -plane contains the points  $A(c, 40)$  and  $B(5, 2c)$ . If the line also contains the origin, what is a possible value of  $c$ ?

