1. Calculate the slope of a line which is parallel to the line passing through the points $(9, 9)$ and $(-5, -8)$

A. $\frac{23}{42}$

B. $\frac{27}{28}$

C. $\frac{13}{28}$

D. Undefined

E. $\frac{17}{14}$

F. $\frac{12}{7}$

G. $\frac{5}{7}$

H. $\frac{55}{28}$

2. A linear equation gives the profit in dollars of a manufacturing company (y) in terms of the number of times a machine breaks down during manufacture (x). The slope of this line is -35. Interpret the meaning of this rate of change.

A. For every additional time a machine breaks, we can expect an increase of 35 dollars.

B. The number of dollars is always equal to each time a machine breaks times -35.

C. The number of dollars can be expressed as each time a machine breaks divided by -35.

D. For every additional time a machine breaks, we can expect an decrease of 35 dollars.

3. Write the equation of the line passing through the points $(-1, -5)$, $(-1, 2)$.

A. $y = -3$

B. $y = -1$

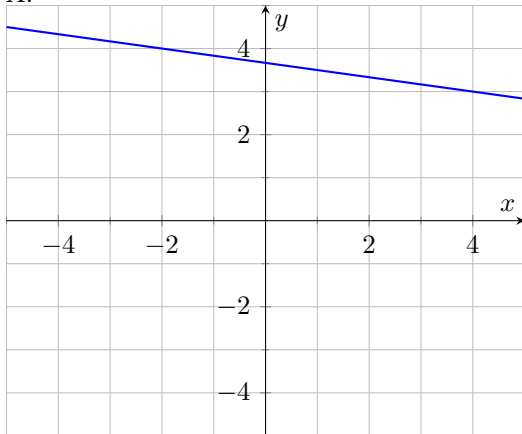C. $x = -1$
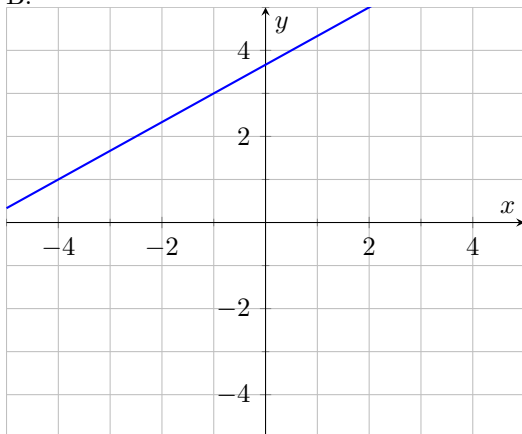
D. $x = -3$

E. $x = -5$

F. $y = -5$

G. $y = 2$

H. $x = 2$

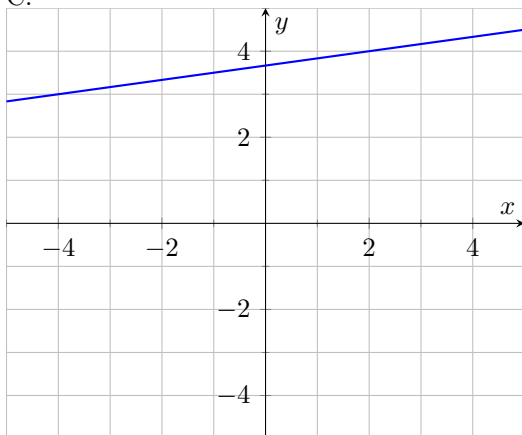4. Using the point-slope form, graph the line $y + 4 = \frac{1}{3}(x + 1)$.

A.

B.
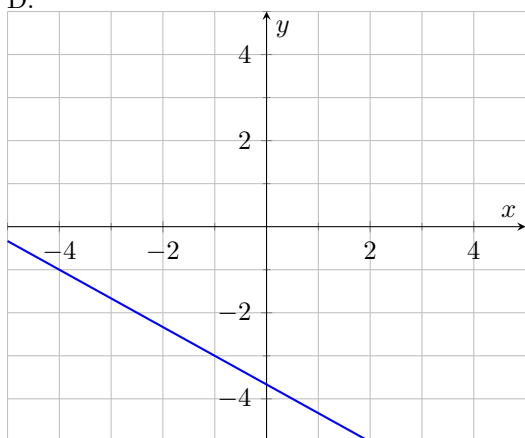

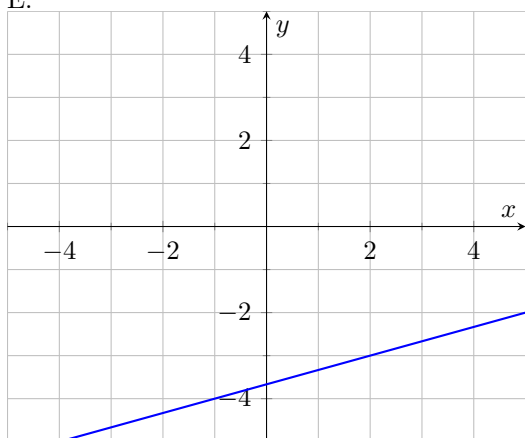C.

MORE OPTIONS ON NEXT PAGE

D.

E.

5. Choose the ordered pair below which is a solution to the system of linear equations $\left\{ \begin{array}{l} -x - 1y = -4 \\ -3x - 2y = -2 \end{array} \right\}$

A. $(-7, 9)$.

B. $(-3, 13)$.

C. $(-9, 7)$.

D. $(-8, 8)$.

E. $(-6, 10)$.

F. $(-5, 11)$.

6. Choose the ordered pair below which is a solution to the system of linear equations $\left\{\begin{array}{l} 3x - 2y = 2 \\ -3x + 3y = 12 \end{array}\right\}$

A. $(13, 17)$.

B. $(11, 15)$.

C. $(8, 12)$.

D. $(9, 13)$.

E. $(10, 14)$.

F. $(12, 16)$.

7. Solve the following linear system by substitution. $\left\{ \begin{array}{c} -x - 3y = 2 \\ 2x + 7y = 2 \end{array} \right\}$

A. $(-20, 6)$.

B. There are infinitely many solutions.

C. $(-17, 9)$.

D. $(-22, 4)$.

E. $(-21, 5)$.

F. $(-24, 2)$.

G. $(-19, 7)$.

H. There is no solution.

8. Billy Bob has two test scores in a psychology class. The mean of these scores is 81 and their range is 21. Use this information to write a system of equations which models this situation.

A. The system is $\left\{ \begin{array}{l} \frac{x+y}{2} = 21 \\ x - y = 81 \end{array} \right\}$.

B. The system is $\left\{ \begin{array}{l} x + \frac{y}{2} = 21 \\ \frac{x}{2} + y = 81 \end{array} \right\}$.

C. The system is $\left\{ \begin{array}{l} \frac{x-y}{2} = 81 \\ x - y = 21 \end{array} \right\}$.

D. The system is $\left\{ \begin{array}{l} x + \frac{y}{2} = 81 \\ \frac{x}{2} - y = 21 \end{array} \right\}$.

E. The system is $\left\{ \begin{array}{l} \frac{x+y}{2} = 81 \\ x - y = 21 \end{array} \right\}$.

F. The system is $\left\{ \begin{array}{l} \frac{x-y}{2} = 81 \\ x + y = 21 \end{array} \right\}$.

G. The system is $\left\{ \begin{array}{l} \frac{x-y}{2} = 21 \\ x + y = 81 \end{array} \right\}$.

H. The system is $\left\{ \begin{array}{l} \frac{x-y}{2} = 21 \\ x - y = 81 \end{array} \right\}$.

9. Solve the following linear system by the addition method. $\left\{ \begin{array}{l} -6x - 3y = -12 \\ -3x - 2y = 0 \end{array} \right\}$

A. $(6, -14)$.

B. There is no solution.

C. $(7, -13)$.

D. There are infinitely many solutions.

E. $(8, -12)$.

F. $(12, -8)$.

G. $(4, -16)$.

H. $(5, -15)$.

10. Solve the following linear system by the addition method. $\left\{ \begin{array}{c} -\frac{x}{5} + \frac{y}{6} = -\frac{1}{5} \\ -\frac{x}{3} + \frac{y}{3} = 0 \end{array} \right\}$

A. There is no solution.

B. $(8, 8)$.

C. $(4, 4)$.

D. $(3, 3)$.

E. There are infinitely many solutions.

F. $(2, 2)$.

G. $(9, 9)$.

H. $(6, 6)$.

11. A small boat can go 26 km downstream in 2.5 hr but only 19 km upstream in 2.5 hr. Determine the rate of the boat and the rate of the current.

A. The speed of the boat is 9.4 km/hr and the speed of the current is 1.7 km/hr.

B. The speed of the boat is 9 km/hr and the speed of the current is 1.4 km/hr.

C. The speed of the boat is 8.2 km/hr and the speed of the current is 1.8 km/hr.

D. The speed of the boat is 9.3 km/hr and the speed of the current is 1.9 km/hr.

E. The speed of the boat is 8.6 km/hr and the speed of the current is 1.1 km/hr.

F. The speed of the boat is 8.3 km/hr and the speed of the current is 0.6 km/hr.

G. The speed of the boat is 8.7 km/hr and the speed of the current is 2.1 km/hr.

H. The speed of the boat is 9.5 km/hr and the speed of the current is 1 km/hr.

12. A goldsmith named Jake N. would like to make 70 g of a gold alloy which is 78% gold. How much of an alloy which is 86% gold, and another alloy which is 58% gold, should the goldsmith use? Round your answer to the nearest gram.

A. The goldsmith should melt down 45 g of the 86% alloy with 25 g of the 58% alloy.

B. The goldsmith should melt down 38 g of the 86% alloy with 33 g of the 58% alloy.

C. The goldsmith should melt down 48 g of the 86% alloy with 22 g of the 58% alloy.

D. The goldsmith should melt down 50 g of the 86% alloy with 20 g of the 58% alloy.

E. The goldsmith should melt down 32 g of the 86% alloy with 38 g of the 58% alloy.

F. The goldsmith should melt down 35 g of the 86% alloy with 35 g of the 58% alloy.

G. The goldsmith should melt down 40 g of the 86% alloy with 30 g of the 58% alloy.

H. The goldsmith should melt down 43 g of the 86% alloy with 27 g of the 58% alloy.

13. Below is a graph of the system of linear equations $\left\{ \begin{array}{l} y = 1 \\ y = x - 1 \end{array} \right\}$. Use this graph to solve the linear inequality $1 < x - 1$.
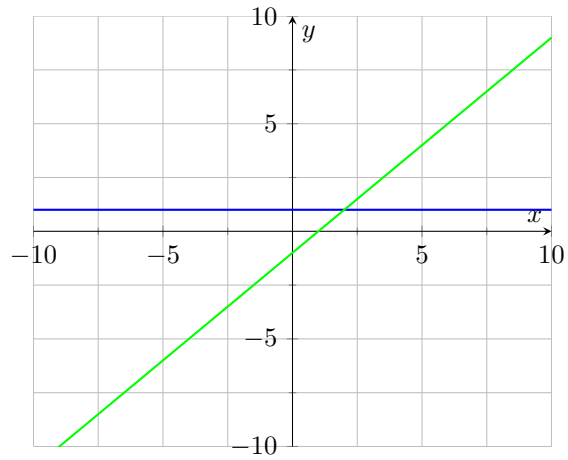
A. $x > -1$

B. $x < 4$

C. $x > 4$

D. $x < -1$

E. $x < 2$

F. $x > 2$

14. **Costs and Revenue** The daily cost of producing x units of cellular phones includes a fixed cost of $600 per day and a variable cost of $11 per unit. The income produced by selling x units is $16 per unit. Letting y_1 represent the income and y_2 represent the cost, graph y_1 and y_2. Determine the values of x for which $y_1 > y_2$, the profit interval for this company.

A. The profit interval is $x < 124$.

B. The profit interval is $x > 120$.

C. The profit interval is $x < 121$.

D. The profit interval is $x > 115$.

E. The profit interval is $x < 114$.

F. The profit interval is $x > 126$.

G. The profit interval is $x > 123$.

H. The profit interval is $x < 117$.

15. Solve the following linear inequality $-2x + 4 \geq -4$.

A. $x \leq 4$

B. $x \leq -12$

C. $-1 \geq x$

D. $-\frac{4}{3} \geq x$

E. $x \leq 16$

F. $x \leq 8$

G. $12 \geq x$

H. $x \leq -16$

16. Solve the following linear inequality $3x + 4 \leq 5x + 1$.

A. $x \geq 6$

B. $-\frac{9}{2} \leq x$

C. $-\frac{3}{2} \leq x$

D. $x \geq \frac{3}{2}$

E. $\frac{3}{8} \leq x$

F. $-6 \leq x$

G. $3 \leq x$

H. $-\frac{1}{2} \leq x$

17. Solve the following linear inequality $3x - 1 > 0$ AND $x + 1 \leq 3$.

A. $2 < x \leq \frac{1}{3}$

B. $x > \frac{7}{3}$ OR $x \leq 4$

C. $\frac{1}{3} < x \leq 2$

D. $2 \leq x < \frac{1}{3}$

E. $\frac{1}{3} \leq x < 2$

F. $1 \leq x \leq -\frac{2}{3}$

G. $-\frac{2}{3} \leq x \leq 1$

H. The inequality has no solutions. Therefore, it is a contradiction.

18. Solve the following linear inequality $3x - 5 > 2$ AND $x + 3 < 0$.

A. The inequality has no solutions. Therefore, it is a contradiction.

B. $-6 < x < -\frac{2}{3}$

C. $x < \frac{8}{3}$ OR $x > -\frac{8}{3}$

D. $-\frac{2}{3} < x < -6$

E. $x > \frac{8}{3}$ OR $x < -\frac{8}{3}$

F. $-3 < x < \frac{7}{3}$

G. $x > \frac{1}{3}$ OR $x < -5$

H. $x < \frac{1}{3}$ OR $x > -5$

19. Solve the following linear equation $|-3x+1| = |-x-4|$.

A. $-\frac{5}{6}$ or $\frac{3}{2}$

B. $-\frac{5}{4}$ or 3

C. $\frac{15}{2}$ or $-\frac{3}{8}$

D. 10 or -3

E. $\frac{5}{2}$ or $-\frac{3}{4}$

F. -5 or $-\frac{9}{4}$

G. $\frac{5}{4}$ or $-\frac{3}{16}$

H. $\frac{5}{8}$ or $\frac{1}{4}$

20. Solve the following inequality $|(2x+5) - 2(-4x - 5)| \geq 3$.

A. $-\frac{3}{5} \leq x \leq \frac{18}{5}$

B. $-\frac{9}{10} \leq x \leq \frac{3}{5}$

C. $x \leq -\frac{9}{5}$ or $x \geq -\frac{6}{5}$

D. $x \leq \frac{3}{10}$ or $x \geq \frac{9}{20}$

E. $\frac{3}{10} \leq x \leq \frac{9}{20}$

F. $-\frac{9}{5} \leq x \leq -\frac{6}{5}$

G. $x \leq -\frac{3}{5}$ or $x \geq \frac{18}{5}$

H. $x \leq -\frac{9}{10}$ or $x \geq \frac{3}{5}$

Answers

1. E.

2. D.

3. C.

4. E.

5. E.

6. E.

7. A.

8. E.

9. E.

10. H.

11. B.

12. D.

13. F.

14. B.

15. A.

16. D.

17. C.

18. A.

19. E.

20. C.