1. Calculate the slope of a line which is parallel to the line passing through the points $(9, -5)$ and $(7, 5)$

A. $-\frac{29}{6}$

B. $-\frac{17}{4}$

C. $-\frac{19}{4}$

D. $-\frac{11}{2}$

E. -5

F. $-\frac{13}{3}$

G. $-\frac{9}{2}$

H. Undefined

2. The water tank on a firetruck holds 1600 gal of water. This water is used so the firefighters can begin pumping water as soon as they arrive at a fire. The volume of water remaining in the tank x seconds after the pump has been turned on is displayed in the table.

x seconds	y gallons
0	1600
7	1432
14	1264
21	1096
28	928

(a.) Determine the rate of change of the volume with respect to time. (b.) Interpret the meaning of this value. (c.) At this rate, how long do the firefighters have to connect to a hydrant before the water in the tank runs out? Caution: be careful with units.

A. (a.) The rate of change is -18 gallons/second. (b.) This means that for every second the hose is turned on, the volume of water in the tank will decrease by 18 gallons. (c.) The firefighters have about 62.7 seconds before they must connect to a hydrant.

B. (a.) The rate of change is -14 gallons/minute. (b.) This means that for every minute the hose is turned on, the volume of water in the tank will decrease by 14 gallons. (c.) The firefighters have about 60.7 minutes before they must connect to a hydrant.

C. (a.) The rate of change is -19 gallons/minute. (b.) This means that for every minute the hose is turned on, the volume of water in the tank will decrease by 19 gallons. (c.) The firefighters have about 67.7 minutes before they must connect to a hydrant.

D. (a.) The rate of change is -19 gallons/second. (b.) This means that for every second the hose is turned on, the volume of water in the tank will decrease by 19 gallons. (c.) The firefighters have about 67.7 seconds before they must connect to a hydrant.

E. (a.) The rate of change is -14 gallons/second. (b.) This means that for every second the hose is turned on, the volume of water in the tank will decrease by 14 gallons. (c.) The firefighters have about 60.7 seconds before they must connect to a hydrant.

F. (a.) The rate of change is -18 gallons/minute. (b.) This means that for every minute the hose is turned on, the volume of water in the tank will decrease by 18 gallons. (c.) The firefighters have about 62.7 minutes before they must connect to a hydrant.

G. (a.) The rate of change is -24 gallons/minute. (b.) This means that for every minute the hose is turned on, the volume of water in the tank will decrease by 24 gallons. (c.) The firefighters have about 66.7 minutes before they must connect to a hydrant.

H. (a.) The rate of change is -24 gallons/second. (b.) This means that for every second the hose is turned on, the volume of water in the tank will decrease by 24 gallons. (c.) The firefighters have about 66.7 seconds before they must connect to a hydrant.

3. Use the table

x	$2x-1$	$3x+1$
-5	-11	-14
-4.5	-10	-12.5
-4	-9	-11
-3.5	-8	-9.5
-3	-7	-8
-2.5	-6	-6.5
-2	-5	-5
-1.5	-4	-3.5
-1	-3	-2
-0.5	-2	-0.5
0	-1	1
0.5	0	2.5
1	1	4
1.5	2	5.5
2	3	7
2.5	4	8.5
3	5	10
3.5	6	11.5
4	7	13
4.5	8	14.5
5	9	16

to solve the linear system of equations $\left\{ \begin{array}{l} y = 2x - 1 \\ y = 3x + 1 \end{array} \right\}$.

A. $(1, -2)$

B. $(-2, -5)$

C. $(0, -3)$

D. $(2, -1)$

E. $(-4, -7)$

F. $(-6, -9)$

G. $(-1, -4)$

H. $(-5, -8)$

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

A. $(6, -5)$.

B. $(4, -7)$.

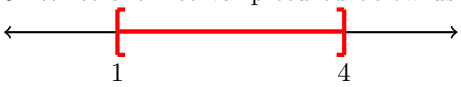
C. $(3, -8)$.

D. $(1, -10)$.

E. $(7, -4)$.

F. $(2, -9)$.

5. Write the interval pictured below using inequality symbols.



A. $1<x\leq 4$

B. $1\leq x<4$

C. $1<x<4$

D. $1\leq x\leq 4$

6. Solve the following linear inequality $-3x + 5 < 4x + 4 \leq -3x + 10$ and express your answer in interval notation.

A. $x \in (\frac{29}{7}, \frac{34}{7}]$

B. $x \in (\frac{6}{7}, \frac{1}{7}]$

C. $x \in [\frac{29}{7}, \frac{34}{7})$

D. $x \in (\frac{1}{7}, \frac{6}{7}]$

E. $x \in [\frac{6}{7}, \frac{1}{7})$

F. $x \in [\frac{1}{7}, \frac{6}{7})$

G. $x \in (\frac{34}{7}, \frac{29}{7}]$

H. $x \in [\frac{34}{7}, \frac{29}{7})$

7. Determine the slope and y-intercept of the line $f(x) = \frac{7}{5}x + \frac{8}{7}$.

A. The slope is $(0, \frac{5}{7})$ and the y-intercept is $\frac{8}{7}$.

B. The slope is $\frac{8}{7}$ and the y-intercept is $(0, \frac{7}{5})$.

C. The slope is $(0, \frac{8}{7})$ and the y-intercept is $\frac{7}{5}$.

D. The slope is $(0, \frac{7}{5})$ and the y-intercept is $\frac{8}{7}$.

E. The slope is $\frac{5}{7}$ and the y-intercept is $(0, \frac{8}{7})$.

F. The slope is $\frac{7}{5}$ and the y-intercept is $(0, \frac{8}{7})$.

G. The slope is $(0, \frac{8}{7})$ and the y-intercept is $\frac{5}{7}$.

H. The slope is $\frac{8}{7}$ and the y-intercept is $(0, \frac{5}{7})$.

8. Determine the slope and y-intercept of the line $f(x) = -2$.

A. The y-intercept is undefined.

B. Both the slope and the y-intercept are undefined.

C. There is not enough information to determine the slope and y-intercept.

D. The slope is 0 and the y-intercept is $(0, -2)$.

E. The slope is undefined, but the y-intercept is $(0, -2)$.

F. The y-intercept is undefined, but the y-intercept is 0.

G. The slope is undefined.

H. The slope is $(0, -2)$ and the y-intercept is 0.

9. Find two numbers whose sum is 145 and whose difference is 40.

A. The first number is 92.5 and the second number is 52.5.

B. The first number is 94.5 and the second number is 50.5.

C. The first number is 95.5 and the second number is 49.5.

D. The first number is 93.5 and the second number is 51.5.

E. The first number is 88.5 and the second number is 56.5.

F. The first number is 89.5 and the second number is 55.5.

G. The first number is 91.5 and the second number is 53.5.

H. The first number is 90.5 and the second number is 54.5.

10. Solve the following linear system by substitution. $\left\{ \begin{array}{l} \frac{x}{7} - \frac{y}{6} = \frac{1}{7} \\ \frac{x}{3} - \frac{y}{3} = -\frac{1}{3} \end{array} \right\}$

A. $(-12, -11)$.

B. $(-11, -10)$.

C. There is no solution.

D. $(-13, -12)$.

E. There are infinitely many solutions.

F. $(-16, -15)$.

G. $(-17, -16)$.

H. $(-9, -8)$.

11. Solve the following linear inequality $2x-4 \geq 5$ OR $x-3 \leq 4$ and express you answer in interval notation.

A. $x \in (-\infty, 5) \cup (\frac{15}{2}, \infty)$

B. $x \in (-\infty, 4] \cap [\frac{3}{2}, \infty)$

C. $x \in (-\infty, \frac{15}{2}] \cup [10, \infty)$

D. $x \in (-\infty, \frac{3}{2}) \cup (4, \infty)$

E. $x \in \mathbb{R} = (-\infty, \infty)$

F. $x \in (-\infty, 7) \cap (\frac{9}{2}, \infty)$

G. $x \in (-\infty, 10) \cap (\frac{15}{2}, \infty)$

H. $x \in (-\infty, 5] \cap [\frac{15}{2}, \infty)$

12. Solve the following linear system by the addition method. $\left\{ \begin{array}{l} -18x - 18y = 24 \\ -3x - 3y = 4 \end{array} \right\}$

A. $(-3, 2)$.

B. $(-5, 0)$.

C. $(3, 8)$.

D. $(1, 6)$.

E. $(-2, 3)$.

F. $(2, 7)$.

G. There is no solution.

H. There are infinitely many solutions.

13. Solve the following linear inequality $-2x \leq x - 3$.

A. $x \geq -\frac{1}{4}$

B. $\frac{1}{3} \leq x$

C. $x \geq -3$

D. $\frac{1}{4} \leq x$

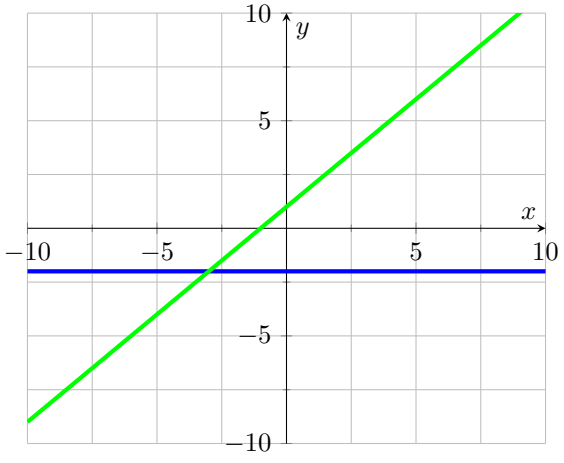
E. $x \geq 1$

F. $4 \leq x$

G. $x \geq \frac{1}{2}$

H. $x \geq -4$

14. Below is a graph of the system of linear equations $\left\{ \begin{array}{l} y = -2 \\ y = x + 1 \end{array} \right\}$. Use this graph to solve the linear inequality $-2 \leq x + 1$.



A. $x \geq 0$

B. $x \leq -3$

C. $x \geq -3$

D. $x \leq -2$

E. $x \leq 0$

F. $x \geq -2$

15. Solve the following linear inequality $5x + 1 < 4x - 2$.

A. $-9 > x$

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

C. $x < 3$

D. $x < -1$

E. $x < -3$

F. $\frac{3}{4} > x$

G. $-\frac{3}{4} > x$

H. $9 > x$

16. Solve the following linear inequality $-3(4x-4) \geq 3(-x-2)$.

A. $x \leq 2$

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

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

D. $x \leq 4$

E. $x \geq -\frac{1}{2}$

F. $x \geq 2$

G. $x \geq 4$

H. $x \leq -8$

17. Solve the following inequality $|-4x+3|>2$.

A. $x<-\frac{5}{8}$ or $x>1$

B. $\frac{1}{4}<x<\frac{5}{4}$

C. $x<-\frac{15}{4}$ or $x>\frac{3}{4}$

D. $-\frac{15}{4}<x<\frac{3}{4}$

E. $x<-\frac{5}{4}$ or $x>\frac{1}{16}$

F. $-\frac{5}{4}<x<\frac{1}{16}$

G. $-\frac{5}{8}<x<1$

H. $x<\frac{1}{4}$ or $x>\frac{5}{4}$

18. Solve the following equation $|-5x-4|=3$.

A. $-\frac{14}{5}$ or $-\frac{1}{10}$

B. $-\frac{21}{5}$ or $\frac{1}{20}$

C. $-\frac{7}{20}$ or $-\frac{1}{15}$

D. $-\frac{7}{10}$ or $\frac{1}{15}$

E. $-\frac{7}{5}$ or $-\frac{1}{5}$

F. $\frac{7}{5}$ or $\frac{1}{10}$

G. $\frac{14}{5}$ or $-\frac{2}{5}$

H. $\frac{7}{20}$ or $-\frac{3}{5}$

19. A goldsmith named Catelynn would like to make 50 g of a gold alloy which is 76% gold. How much of an alloy which is 81% gold, and another alloy which is 58% gold, should the goldsmith use? Write a system of equations which models this situation.

A. The system is $\left\{ \begin{array}{c} 0.81x + 0.76y = 50 \\ 0.58x + 0.76y = 50 \end{array} \right\}$.

B. The system is $\left\{ \begin{array}{c} 0.81x + y = 0.76 \cdot 50 \\ 0.58x + y = 0.76 \cdot 50 \end{array} \right\}$.

C. The system is $\left\{ \begin{array}{c} 0.81x + y = 50 \\ 0.58x + y = 0.76 \cdot 50 \end{array} \right\}$.

D. The system is $\left\{ \begin{array}{c} x + y = 50 \\ 0.81x + 0.58y = 50 \end{array} \right\}$.

E. The system is $\left\{ \begin{array}{c} x + y = 0.76 \cdot 50 \\ 0.81x + 0.58y = 50 \end{array} \right\}$.

F. The system is $\left\{ \begin{array}{c} x + y = 50 \\ 0.81x + 0.58y = 0.76 \cdot 50 \end{array} \right\}$.

G. The system is $\left\{ \begin{array}{c} 0.81x + y = 0.76 \cdot 50 \\ 0.58x + y = 50 \end{array} \right\}$.

H. The system is $\left\{ \begin{array}{c} 0.81x + y = 0.76 \cdot 50 \\ x + 0.58y = 50 \end{array} \right\}$.

20. A goldsmith named Holly would like to make 65 g of a gold alloy which is 72% gold. How much of an alloy which is 81% gold, and another alloy which is 55% gold, should the goldsmith use? Round your answer to the nearest tenth of a gram.

A. The goldsmith should melt down 50.7 g of the 81% alloy with 14.3 g of the 55% alloy.

B. The goldsmith should melt down 57.2 g of the 81% alloy with 7.8 g of the 55% alloy.

C. The goldsmith should melt down 45.3 g of the 81% alloy with 19.7 g of the 55% alloy.

D. The goldsmith should melt down 55.0 g of the 81% alloy with 10.0 g of the 55% alloy.

E. The goldsmith should melt down 40.5 g of the 81% alloy with 24.5 g of the 55% alloy.

F. The goldsmith should melt down 52.5 g of the 81% alloy with 12.5 g of the 55% alloy.

G. The goldsmith should melt down 42.5 g of the 81% alloy with 22.5 g of the 55% alloy.

H. The goldsmith should melt down 47.2 g of the 81% alloy with 17.8 g of the 55% alloy.

Answers

1. E.
2. H.
3. B.
4. B.
5. D.
6. D.
7. F.
8. D.
9. A.
10. D.
11. E.
12. H.
13. E.
14. C.
15. E.
16. A.
17. H.
18. E.
19. F.
20. G.