Simplify all answers and show your work! You may use MathGV as a tool.

1. In the linear equation \(2x - 9y = 18\), what is the x-intercept? \((9, 0)\) y-intercept? \((0, -2)\)

2. In the equation \(4x + 5y = 11\), what is the value of the slope? \(\frac{4}{5}\)

3. In the equation \(Ax + By = C\), what is the value of the slope? \(\frac{-A}{B}\)

4. Lines that are parallel have the same ___slope____.

Find the equations of the lines with the given properties:

5. Passing through points \((2, 4)\) and \((-3, -2)\).

6. Passing through \((-2, 4)\) and having a slope of \(-\frac{3}{5}\).

7. Passing through \((0, 5.1)\) and having a slope of -2.8.

\[
\begin{align*}
6x - 5y &= -8 \quad \text{or} \quad y = \frac{6}{5}x + \frac{8}{5} \\
3x + 5y &= 14 \quad \text{or} \quad y = -\frac{3}{5}x + \frac{14}{5} \\
y &= -2.8x + 5.1
\end{align*}
\]

8. Solve for x: \(5(4 - x) = 6(x - 3) + 2x\)

\(x = \frac{38}{13}\)

9. Graph \(4x - 5y = 20\)

10. Graph the following system of equations.

\[
\begin{align*}
y &= 3x - 2 \\
y &= -\frac{1}{2}x + 5
\end{align*}
\]

and find the point of intersection. \((2, -3)\)

11. Solve the system of equations:

\[
\begin{align*}
5x - y &= 13 \\
x + 4y &= -10
\end{align*}
\]

\((2, 4)\)
Determine if the following pairs of lines cross in one point, are parallel, or are the same line.

12. \[
\begin{align*}
7x - 2y &= 13 \\
2x - 7y &= 13
\end{align*}
\]
13. \[
\begin{align*}
4x - 4y &= 12 \\
x - y &= 3
\end{align*}
\]
14. \[
\begin{align*}
6x + 9y &= 15 \\
2x + 3y &= 10
\end{align*}
\]

- cross in one point
- same line
- parallel lines

15. A contractor purchases a piece of equipment for $25,000. The operating costs total $25 per hour.

a) What is the rate of change of cost of operation per hour? 

$25 per hour

b) Find the equation of the line “y” that represents the total cost of the piece of equipment plus operation for “x” hours.

\[y = 25x + 25,000\]

c) How much does it cost to operate the piece of equipment for 250 hours?

$31,250

d) How many hours will the piece of equipment run to incur a total cost of $38,250?

530 hours

16. In 1980, the population of a town was approximately 314,000 people. In 1990, the population of the same town was approximately 336,000. Let “x” represent the number of years after 1980 and “f(x)” represent the number of people in the town “x” years after 1980.

a) What is the rate of change of the population per year?

2200 people per year

b) Find the equation of the line f(x).

\[f(x) = 2200x + 314,000\]

c) What value of x represents the year 2004?

x = 24

d) If the rate of change remains the same, what is the expected population in 2004?

366,800 people

e) During what year is the population expected to be 400,000?

2019

17. The cost of renting a U-Haul truck for a day and driving the truck “x” miles is given by the linear equation \[C(x) = 0.79x + 29.95\].

a) What is the cost of driving the truck 300 miles?

$266.95

b) How much would it cost to rent a truck for a day if the truck is not driven any miles?

$29.95

c) What is the average rate of change in dollars per mile?

$0.79 per mile

d) How many miles can be driven for a cost of $355.43?

412 miles