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

1. In the linear equation $3x + 5y = 15$, what is the x-intercept? $(5, 0)$ y-intercept? $(0, 3)$

2. In the equation $4x - 7y = 12$, what is the value of the slope? $\frac{4}{7}$

3. Lines that are parallel have the same slope.

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

Find the equations of the lines with the given properties:

5. Passing through points $(2, 3)$ and $(-1, 6)$.
   
   
   
   
   $x + y = 5$ or $y = -x + 5$

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

   
   
   
   

   $5x + 3y = -1$ or $y = -\frac{5}{3}x - \frac{1}{3}$

7. Solve for $x$: $2(x + 5) = 3x - 4(x + 1)$

   
   
   
   

   $x = \frac{-14}{3}$

8. If $f(x) = \frac{7x + 2}{9}$, find the inverse ($f^{-1}(x)$).

   
   
   
   

   $f^{-1}(x) = \frac{9x - 2}{7}$

9. Graph the following system of equations. and find the point of intersection.

   
   
   
   

   $\begin{cases} y = 2x - 4 \\ y = -\frac{1}{3}x + 3 \end{cases}$

   
   
   

   \[ \text{← see diagram} \quad (2, 1) \quad (3, 2) \]

10. Solve the system of equations:

    
    
    
    

    $\begin{cases} 5x - 2y = 8 \\ 3x + y = 7 \end{cases}$

Determine if the following pairs of lines cross in one point, are parallel, or are the same line.

11. $\begin{cases} x + 5y = 13 \\ 3x + 15y = 39 \end{cases}$

   
   
   
   

   same line

12. $\begin{cases} 7x - 7y = 2 \\ x - y = 2 \end{cases}$

   
   
   
   

   parallel

13. $\begin{cases} 3x + 5y = 12 \\ 6x - 10y = 29 \end{cases}$

   
   
   
   

   cross in one point
14. A storage tank contains 540 gallons. Gasoline is then pumped out of the storage tank at a rate of 12 gallons per minute until the tank is empty. Let \( G(x) \) represent the amount of gasoline left in the tank after “x” minutes.

a) What is the rate of change?

\(-12 \text{ gallons per minute}\)

b) How much gasoline is in the tank when \( x = 0 \)?

\( 540 \text{ gallons} \)

c) Find the linear equation \( G(x) \).

\( G(x) = -12x + 540 \)

d) How much gasoline is in the tank after 10 minutes?

\( 420 \text{ gallons} \)

e) How many minutes does it take to empty the tank?

\( 45 \text{ minutes} \)

15. Ammonium chloride salt must be a certain temperature to dissolve in a given amount of water. At 10\(^\circ\) Celsius, 33 grams of water can be dissolved; and at 40\(^\circ\) Celsius, 48 grams of water can be dissolved. Let \( g(x) \) represent the number of grams of ammonium chloride salt that can be dissolved at \( x \)\(^\circ\) Celsius.

a) What is average rate of change in grams per degree Celsius?

\( \frac{1}{2} \text{ grams per degree} \)

b) Find the equation \( g(x) \).

\[ g(x) = \frac{1}{2}x + 28 \quad \text{or} \quad x - 2y = -56 \]

c) How many grams can be dissolved at 0\(^\circ\) Celsius?

\( 28 \text{ grams} \)

d) What would the temperature need to be to dissolve 100 grams of ammonium chloride in the water?

\( 144^\circ \)

16. The number of calories burned by cycling for “x” hours can be calculated by the formula \( C(x) = 794x \).

a) How many calories are burned per hour of cycling?

\( 794 \text{ calories per hour} \)

b) Lance Armstrong cycles 6 hours a day. How many calories does he burn each day by cycling?

\( 4764 \text{ calories} \)

c) If 1 pound of weight is 3500 calories, how long does one have to cycle to exercise off 1 pound?

\( \text{about 4.41 hours} \)

17. Kim bought $0.42 stamps for letters and $0.27 stamps for postcards. She bought a total of 170 stamps for $53.40. How many stamps for postcards did she buy?

\( 120 \text{ stamps for postcards} \)