8th Grade Math
Winter Break Packet

*This packet is due the day we return from Break*
Tuesday, January 7th
Unit 4, Lesson 5

Practice Problems

1. Solve each of these equations. Explain or show your reasoning.

   \[2(x + 5) = 3x + 1\]  \[3y - 4 = 6 - 2y\]  \[3(n + 2) = 9(6 - n)\]

2. Clare was solving an equation, but when she checked her answer she saw her solution was incorrect. She knows she made a mistake, but she can’t find it. Where is Clare’s mistake and what is the solution to the equation?

   \[12(5 + 2y) = 4y - (5 - 9y)\]
   \[72 + 24y = 4y - 5 - 9y\]
   \[72 + 24y = -5y - 5\]
   \[24y = -5y - 77\]
   \[29y = -77\]
   \[y = \frac{-77}{29}\]

3. Solve each equation, and check your solution.

   \[\frac{1}{9}(2m - 16) = \frac{1}{3}(2m + 4)\]  \[-4(r + 2) = 4(2 - 2r)\]  \[12(5 + 2y) = 4y - (6 - 9y)\]

4. Here is the graph of a linear equation.
Select all true statements about the line and its equation.

A. One solution of the equation is \((3, 2)\).
B. One solution of the equation is \((-1, 1)\).
C. One solution of the equation is \(\left(1, \frac{3}{2}\right)\).
D. There are 2 solutions.
E. There are infinitely many solutions.
F. The equation of the line is \(y = \frac{1}{4}x + \frac{5}{4}\).
G. The equation of the line is \(y = \frac{5}{4}x + \frac{1}{4}\).

5. A participant in a 21-mile walkathon walks at a steady rate of 3 miles per hour. He thinks, “The relationship between the number of miles left to walk and the number of hours I already walked can be represented by a line with slope -3.” Do you agree with his claim? Explain your reasoning.
Unit 4, Lesson 13

Practice Problems

1. a. Write equations for the lines shown.

   ![Graph of two lines intersecting at point (5, -19)]

   b. Describe how to find the solution to the corresponding system by looking at the graph.

   c. Describe how to find the solution to the corresponding system by using the equations.

2. The solution to a system of equations is (5, -19). Choose two equations that might make up the system.
   
   A. \( y = -3x - 6 \)
   B. \( y = 2x - 23 \)
   C. \( y = -7x + 16 \)
   D. \( y = x - 17 \)
E. \( y = -2x - 9 \)

3. Solve the system of equations:
   \[
   \begin{align*}
   y &= 4x - 3 \\
   y &= -2x + 9
   \end{align*}
   \]

4. Solve the system of equations:
   \[
   \begin{align*}
   y &= \frac{5}{4}x - 2 \\
   y &= \frac{-1}{4}x + 19
   \end{align*}
   \]

5. Here is an equation: \( \frac{15(x-3)}{5} = 3(2x - 3) \)
   
   a. Solve the equation by using the distributive property first.
   
   b. Solve the equation without using the distributive property.
   
   c. Check your solution.
Unit 3, Lesson 10
Practice Problems

1. For each graph, calculate the slope of the line.

![Graph A]

![Graph B]

![Graph C]

2. Match each pair of points to the slope of the line that joins them.

A. (9, 10) and (7, 2)  
B. (-8, -11) and (-1, -5)  
C. (5, -6) and (2, 3)  
D. (6, 3) and (5, -1)  
E. (4, 7) and (6, 2)

1. 4  
2. -3  
3. $\frac{5}{2}$  
4. $\frac{6}{7}$
3. Draw a line with the given slope through the given point. What other point lies on that line?

![Graph with points A, B, C, D, E, and F]

- a. Point A, slope = -3
- b. Point A, slope = \(-\frac{1}{4}\)
- c. Point C, slope = \(\frac{1}{2}\)
- d. Point E, slope = \(\frac{2}{3}\)

4. Make a sketch of a linear relationship with a slope of 4 and a negative y-intercept. Show how you know the slope is 4 and write an equation for the line.
Unit 3, Lesson 12

Practice Problems

1. Select all of the ordered pairs \((x, y)\) that are solutions to the linear equation \(2x + 3y = 6\).
   
   - A. \((0, 2)\)
   - B. \((0, 6)\)
   - C. \((2, 3)\)
   - D. \((3, -2)\)
   - E. \((3, 0)\)
   - F. \((6, -2)\)

2. The graph shows a linear relationship between \(x\) and \(y\).

   \(x\) represents the number of comic books Priya buys at the store, all at the same price, and \(y\) represents the amount of money (in dollars) Priya has after buying the comic books.

   ![Graph](image)

   a. Find and interpret the \(x\)- and \(y\)-intercepts of this line.
   
   b. Find and interpret the slope of this line.
   
   c. Find an equation for this line.
   
   d. If Priya buys 3 comics, how much money will she have remaining?
3. Match each equation with its three solutions.

A. \( y = 1.5x \) 
   1. (14, 21), (2, 3), (8, 12)

B. \( 2x + 3y = 7 \) 
   2. (-3, -7), (0, -4), (-1, -5)

C. \( x - y = 4 \) 
   3. \( \left( \frac{1}{2}, \frac{1}{2} \right), \left( \frac{1}{4}, \frac{3}{4} \right), \left( \frac{1}{8}, \frac{7}{8} \right) \)

D. \( 3x = \frac{y}{2} \) 
   4. \( \left( 1, 1 \frac{2}{3} \right), \left( -1, 3 \right), \left( 0, 2 \frac{1}{3} \right) \)

E. \( y = -x + 1 \) 
   5. (0.5, 3), (1, 6), (1.2, 7.2)

4. A container of fuel dispenses fuel at the rate of 5 gallons per second. If \( y \) represents the amount of fuel remaining in the container, and \( x \) represents the number of seconds that have passed since the fuel started dispensing, then \( x \) and \( y \) satisfy a linear relationship.

   In the coordinate plane, will the slope of the line representing that relationship have a positive, negative, or zero slope? Explain how you know.

5. A sandwich store charges a delivery fee to bring lunch to an office building. One office pays $33 for 4 turkey sandwiches. Another office pays $61 for 8 turkey sandwiches. How much does each turkey sandwich add to the cost of the delivery? Explain how you know.