Name _____ Date_____

Lesson 1: Writing Equations Using Symbols

Exit Ticket

Write each of the following statements using symbolic language.

1. When you square five times a number, you get three more than the number.

2. Monica had some cookies. She gave seven to her sister. Then, she divided the remainder into two halves, and she still had five cookies left.

Name _____ Date_____

Lesson 2: Linear and Nonlinear Expressions in x

Exit Ticket

Write each of the following statements as a mathematical expression. State whether the expression is a linear or nonlinear expression in x.

1. Seven subtracted from five times a number, and then the difference added to nine times a number

2. Three times a number subtracted from the product of fifteen and the reciprocal of a number

3. Half of the sum of two and a number multiplied by itself three times

Name _____ Date_____

Lesson 3: Linear Equations in x

Exit Ticket

1. Is 8 a solution to $\frac{1}{2}x + 9 = 13$? Explain.

2. Write three different equations that have $x = 5$ as a solution.

3. Is -3 a solution to the equation $3x - 5 = 4 + 2x$? Explain.

Name _____ Date_____

Lesson 4: Solving a Linear Equation

Exit Ticket

1. Guess a number for x that would make the equation true. Check your solution.

$$5x - 2 = 8$$

2. Use the properties of equality to solve the equation $7x - 4 + x = 12$. State which property justifies your first step and why you chose it. Check your solution.

3. Use the properties of equality to solve the equation $3x + 2 - x = 11x + 9$. State which property justifies your first step and why you chose it. Check your solution.

Name _____ Date _____

Lesson 5: Writing and Solving Linear Equations

Exit Ticket

For each of the following problems, write an equation and solve.

1. Given a right triangle, find the measures of all the angles, in degrees, if one angle is a right angle and the measure of the second angle is six less than seven times the measure of the third angle.

2. In a triangle, the measure of the first angle is six times a number. The measure of the second angle is nine less than the first angle. The measure of the third angle is three times the number more than the measure of the first angle. Determine the measure of each angle in degrees.

Name _____ Date _____

Lesson 6: Solutions of a Linear Equation

Exit Ticket

Transform the equation if necessary, and then solve to find the value of x that makes the equation true.

1. $5x - (x + 3) = \frac{1}{3}(9x + 18) - 5$

2. $5(3x + 9) - 2x = 15x - 2(x - 5)$

Name _____ Date _____

Lesson 7: Classification of Solutions

Exit Ticket

Give a brief explanation as to what kind of solution(s) you expect the following linear equations to have. Transform the equations into a simpler form if necessary.

1. $3(6x + 8) = 24 + 18x$

2. $12(x + 8) = 11x - 5$

3. $5x - 8 = 11 - 7x + 12x$

Name _____ Date _____

Lesson 8: Linear Equations in Disguise

Exit Ticket

Solve the following equations for x.

1. $\frac{5x-8}{3} = \frac{11x-9}{5}$

2. $\frac{x+11}{7} = \frac{2x+1}{-8}$

3. $\frac{-x-2}{-4} = \frac{3x+6}{2}$

Name _____ Date _____

Lesson 9: An Application of Linear Equations

Exit Ticket

1. Rewrite the equation that would represent the sum in the fifth step of the Facebook problem:

$$S_5 = 7 + 7 \cdot 5 + 7 \cdot 5^2 + 7 \cdot 5^3 + 7 \cdot 5^4.$$

2. The sum of four consecutive integers is 74. Write an equation, and solve to find the numbers.

Name _____ Date _____

Lesson 10: A Critical Look at Proportional Relationships

Exit Ticket

Alex skateboards at a constant speed from his house to school 3.8 miles away. It takes him 18 minutes.

a. What fraction represents his constant speed, C?

b. After school, Alex skateboards at the same constant speed to his friend's house. It takes him 10 minutes. Write the fraction that represents constant speed, C, if he travels a distance of y.

c. Write the fractions from parts (a) and (b) as a proportion, and solve to find out how many miles Alex's friend's house is from school. Round your answer to the tenths place.

Name _____ Date _____

Lesson 11: Constant Rate

Exit Ticket

Vicky reads at a constant rate. She can read 5 pages in 9 minutes. We want to know how many pages, p, Vicky can read after t minutes.

a. Write a linear equation in two variables that represents the number of pages Vicky reads in any given time interval.

b. Complete the table below. Use a calculator, and round answers to the tenths place.

t (time in minutes)	Linear Equation:	p (pages read)
0		
20		
40		
60		

c. About how long would it take Vicky to read 25 pages? Explain.

Name _____ Date _____

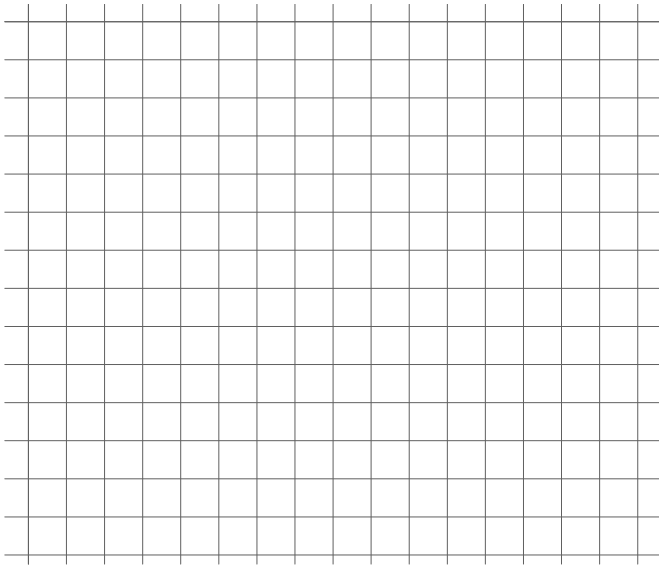
Lesson 12: Linear Equations in Two Variables

Exit Ticket

1. Is the point $(1, 3)$ a solution to the linear equation $5x - 9y = 32$? Explain.

2. Find three solutions for the linear equation $4x - 3y = 1$, and plot the solutions as points on a coordinate plane.

x	**Linear Equation:** $4x - 3y = 1$	y

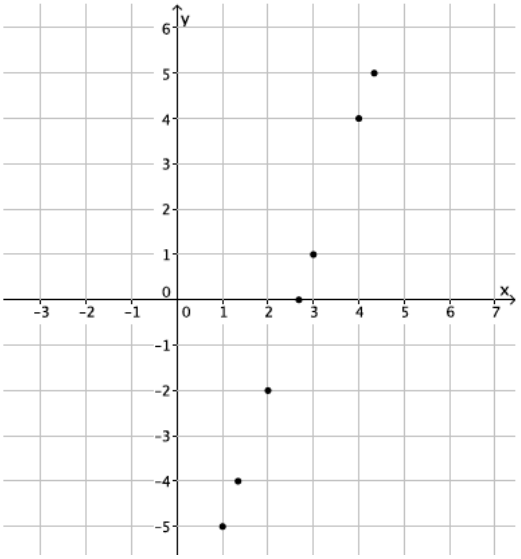


Name _____ Date _____

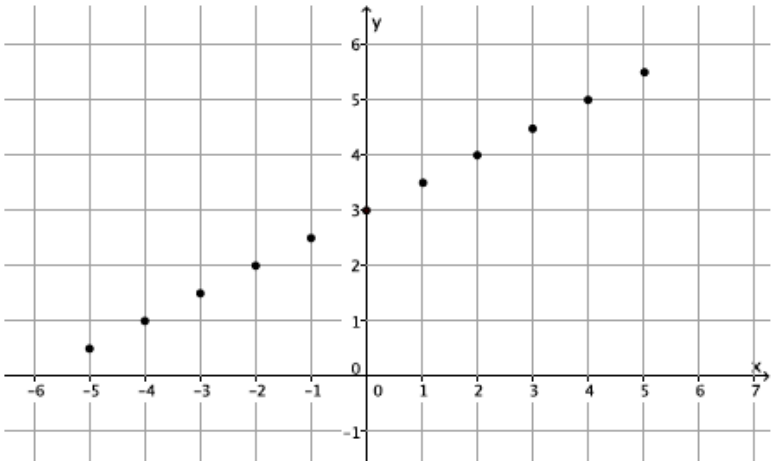
Lesson 13: The Graph of a Linear Equation in Two Variables

Exit Ticket

1. Ethan found solutions to the linear equation $3x - y = 8$ and graphed them. What shape is the graph of the linear equation taking?



2. Could the following points be on the graph of $-x + 2y = 5$?

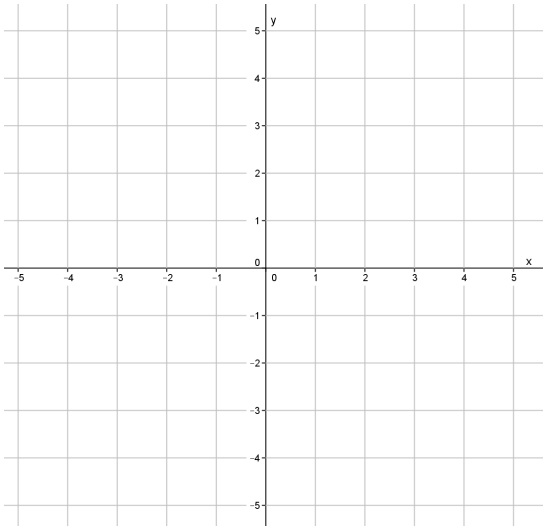


Name _____ Date _____

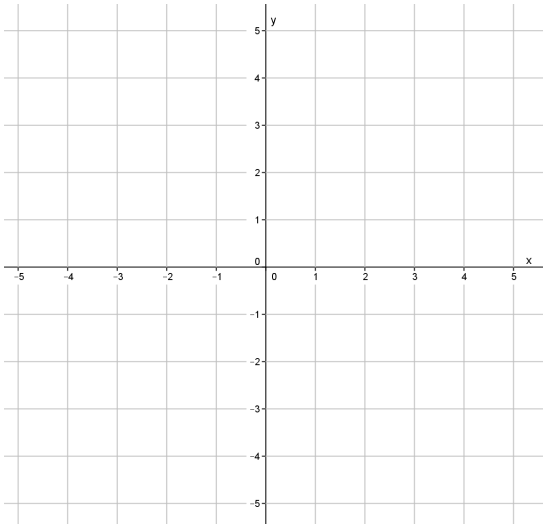
Lesson 14: The Graph of a Linear Equation—Horizontal and Vertical Lines

Exit Ticket

1. Graph the linear equation $ax + by = c$, where $a = 0$, $b = 1$, and $c = 1.5$.



2. Graph the linear equation $ax + by = c$, where $a = 1$, $b = 0$, and $c = -\frac{5}{2}$.



3. What linear equation represents the graph of the line that coincides with the x-axis?

4. What linear equation represents the graph of the line that coincides with the y-axis?

Name _____ Date _____

1. Write and solve each of the following linear equations.

   a. Ofelia has a certain amount of money. If she spends $\$12$, then she has $\frac{1}{5}$ of the original amount left. How much money did Ofelia have originally?

   b. Three consecutive integers have a sum of 234. What are the three integers?

   c. Gil is reading a book that has 276 pages. He already read some of it last week. He plans to read 20 pages tomorrow. By then, he will be $\frac{2}{3}$ of the way through the book. How many pages did Gil read last week?

2.

a. Without solving, identify whether each of the following equations has a unique solution, no solution, or infinitely many solutions.

i. $3x + 5 = -2$

ii. $6(x - 11) = 15 - 4x$

iii. $12x + 9 = 8x + 1 + 4x$

iv. $2(x - 3) = 10x - 6 - 8x$

v. $5x + 6 = 5x - 4$

b. Solve the following equation for a number x. Verify that your solution is correct.

$$-15 = 8x + 1$$

c. Solve the following equation for a number x. Verify that your solution is correct.

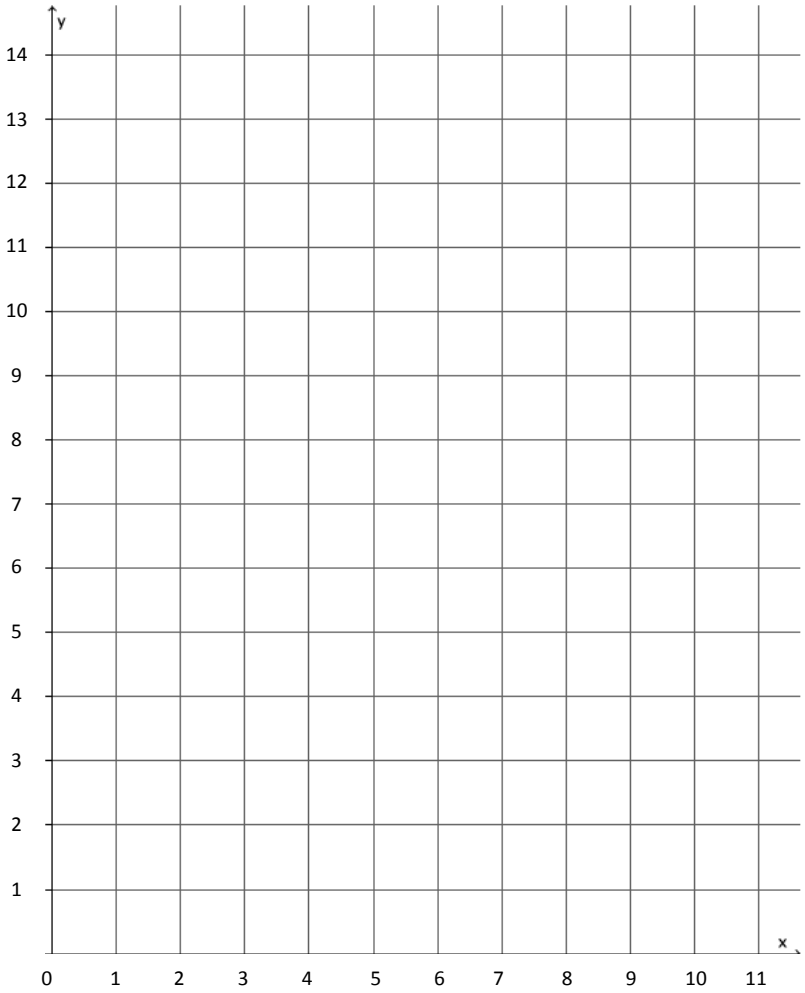
$$7(2x + 5) = 4x - 9 - x$$

3.

a. Parker paid $\$4.50$ for three pounds of gummy candy. Assuming each pound of gummy candy costs the same amount, complete the table of values representing the cost of gummy candy in pounds.

Gummy Candy in Pounds (x)	1	2	3	4	5	6	7	8	9
Cost in Dollars (y)			4.50						

b. Graph the data on the coordinate plane.



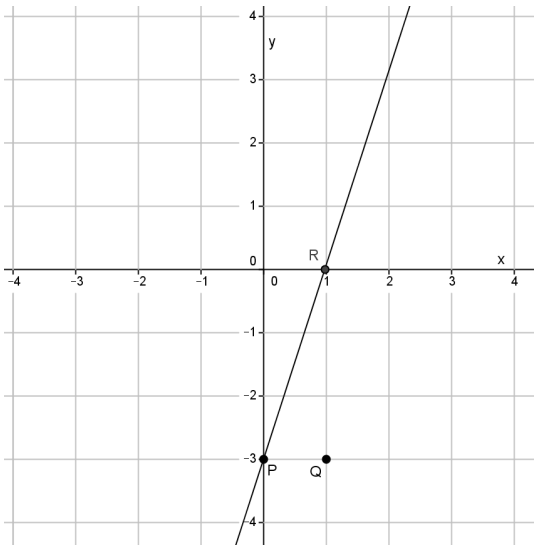
c. On the same day, Parker's friend, Peggy, was charged $\$5$ for $1\frac{1}{2}$ lb. of gummy candy. Explain in terms of the graph why this must be a mistake.

Name _____ Date _____

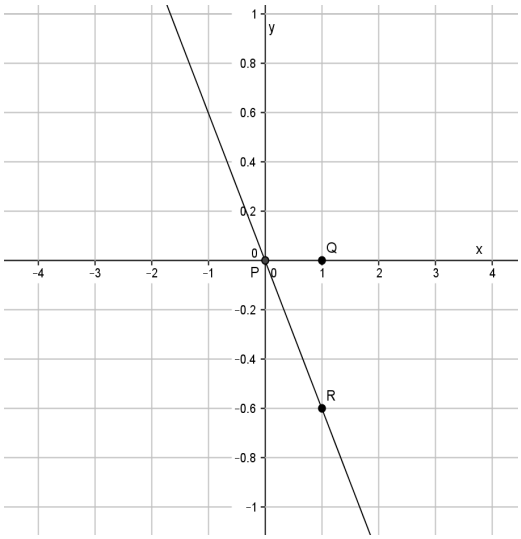
Lesson 15: The Slope of a Non-Vertical Line

Exit Ticket

1. What is the slope of this non-vertical line? Use your transparency if needed.



2. What is the slope of this non-vertical line? Use your transparency if needed.

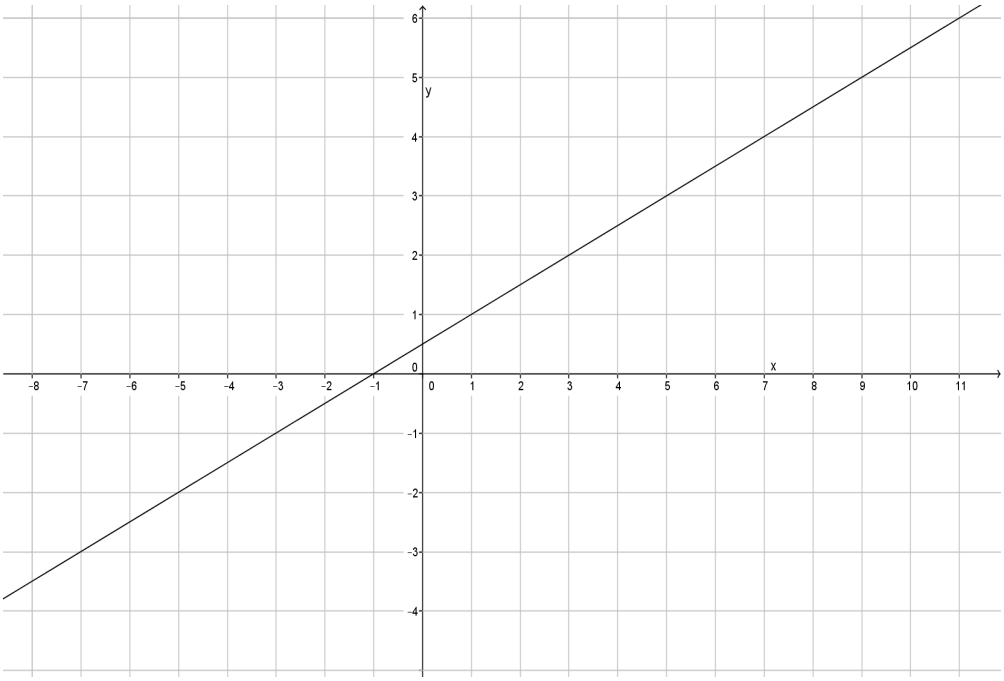


Name _____ Date _____

Lesson 16: The Computation of the Slope of a Non-Vertical Line

Exit Ticket

Find the rate of change of the line by completing parts (a) and (b).



a. Select any two points on the line to label as P and R. Name their coordinates.

b. Compute the rate of change of the line.

Name _____ Date _____

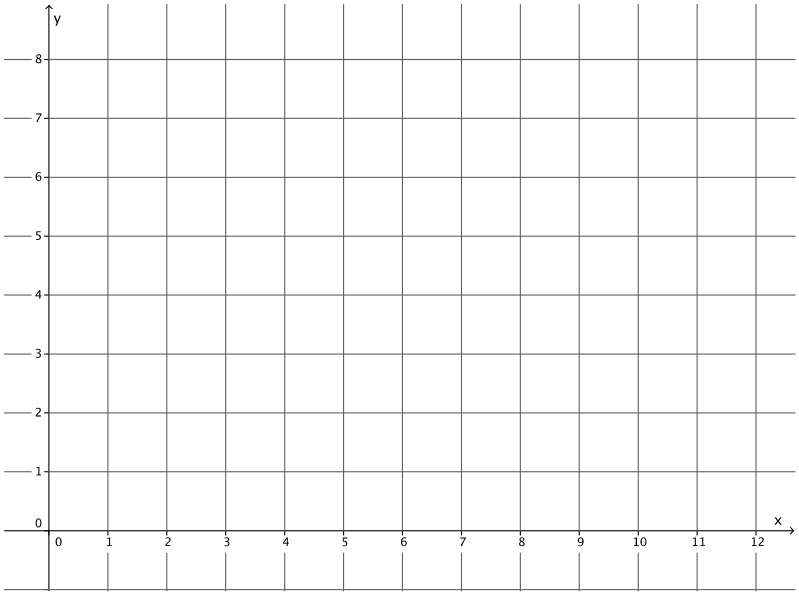
Lesson 17: The Line Joining Two Distinct Points of the Graph $y = mx + b$ Has Slope m

Exit Ticket

1. Solve the following equation for y: $35x - 7y = 49$.

2. What is the slope of the equation in Problem 1?

3. Show, using similar triangles, why the graph of an equation of the form $y = mx$ is a line with slope m.



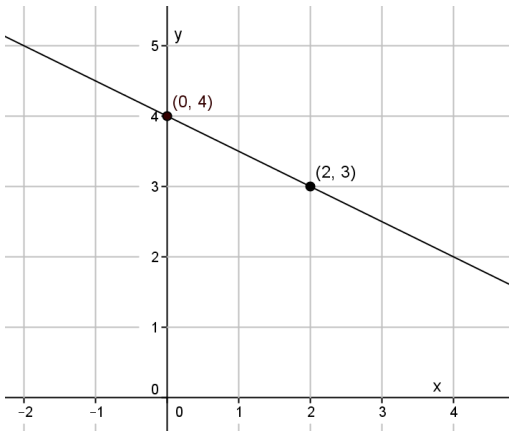
Name _____ Date _____

Lesson 18: There Is Only One Line Passing Through a Given Point with a Given Slope

Exit Ticket

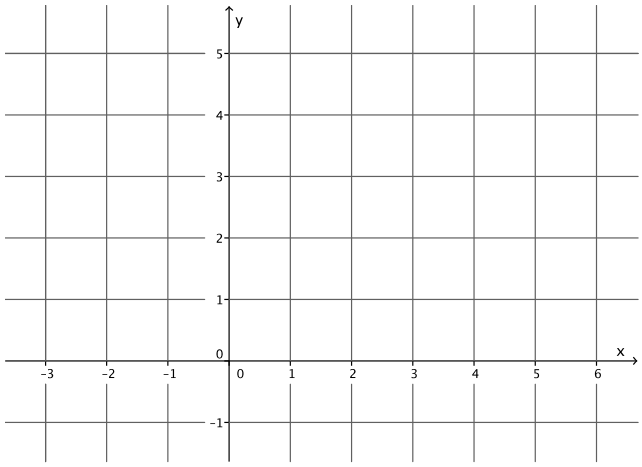
Mrs. Hodson said that the graphs of the equations below are incorrect. Find the student's errors, and correctly graph the equations.

1. Student graph of $y = \frac{1}{2}x + 4$:

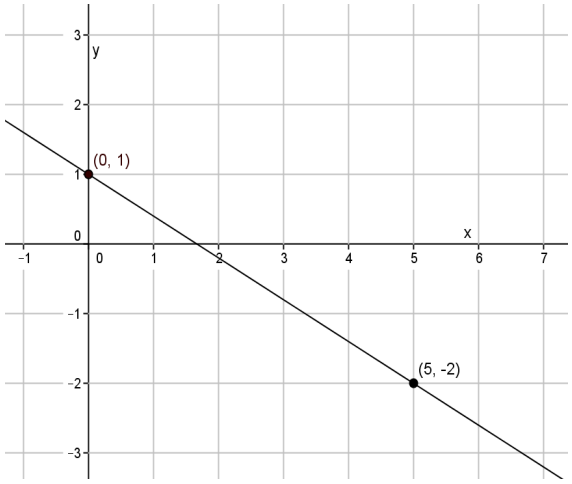


Error:

Correct graph of the equation:

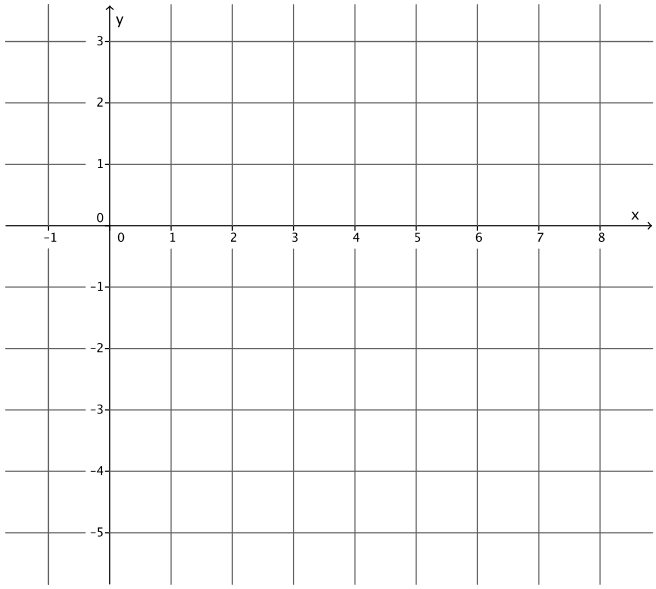


2. Student graph of $y = -\frac{3}{5}x - 1$:



Error:

Correct graph of the equation:

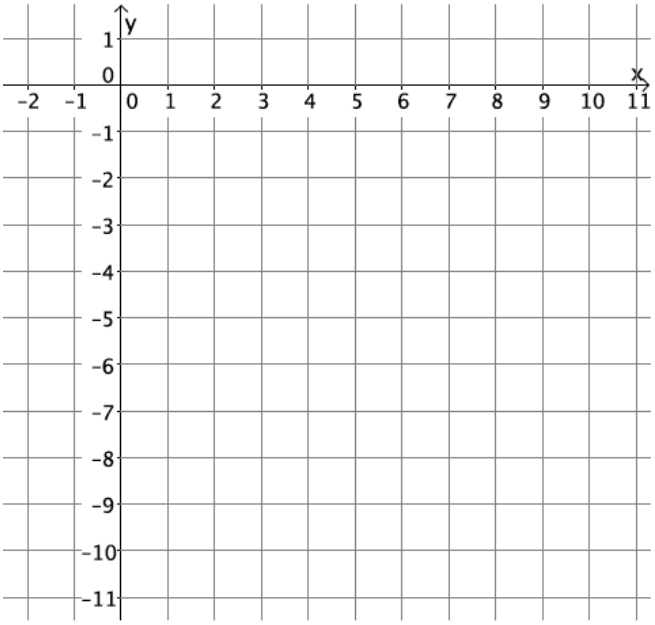


Name _____ Date _____

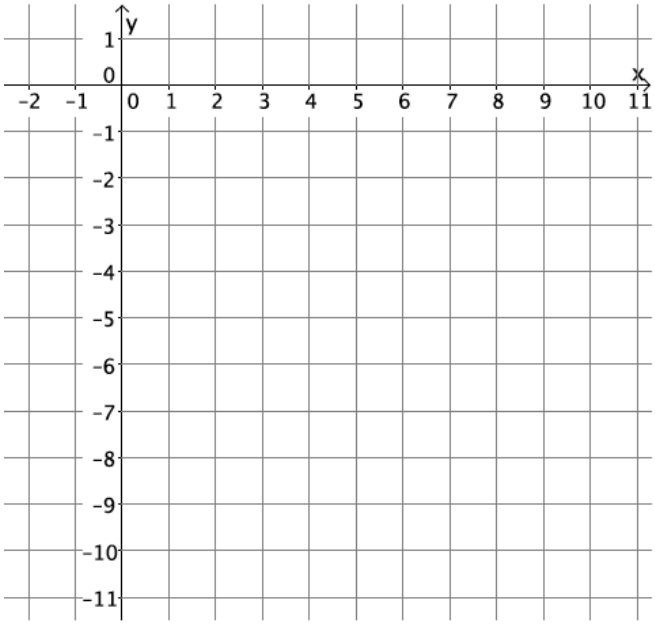
Lesson 19: The Graph of a Linear Equation in Two Variables Is a Line

Exit Ticket

1. Graph the equation $y = \frac{5}{4}x - 10$ using the y-intercept point and slope.



2. Graph the equation $5x - 4y = 40$ using intercepts.



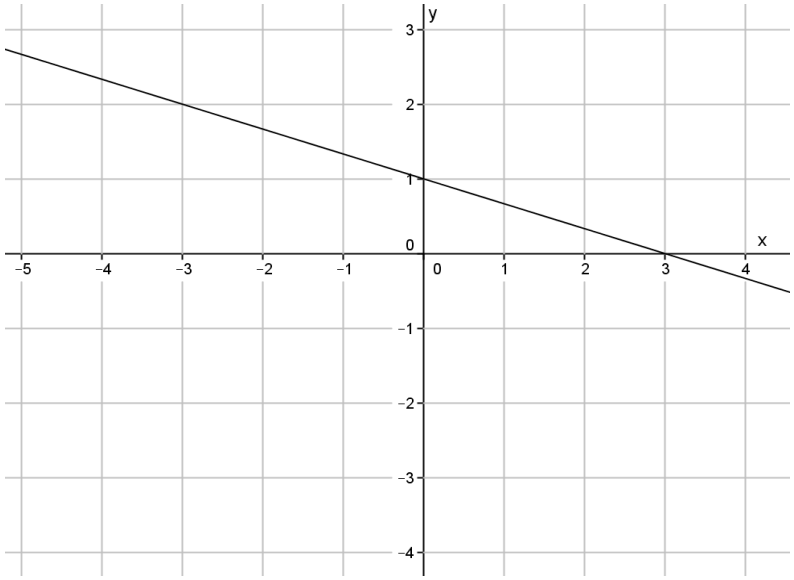
3. What can you conclude about the equations $y = \frac{5}{4}x - 10$ and $5x - 4y = 40$?

Name _____ Date _____

Lesson 20: Every Line Is a Graph of a Linear Equation

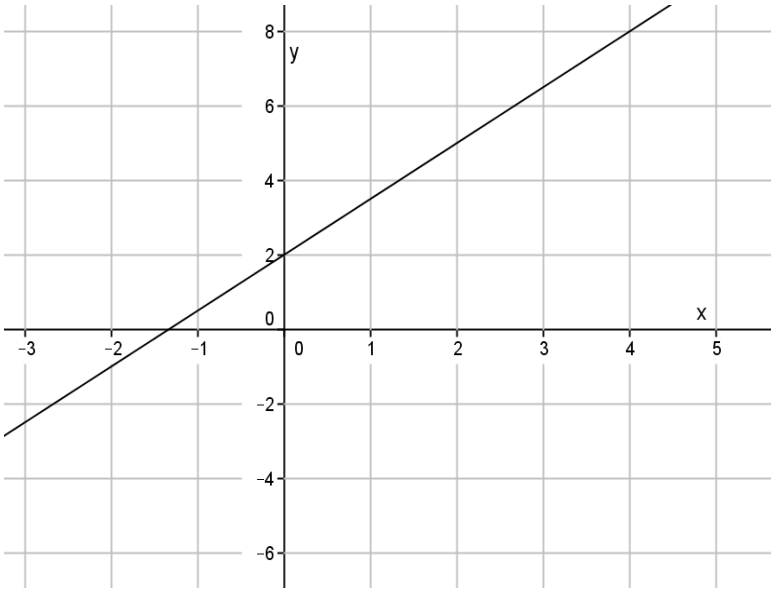
Exit Ticket

1. Write an equation in slope-intercept form that represents the line shown.



2. Use the properties of equality to change the equation you wrote for Problem 1 from slope-intercept form, $y = mx + b$, to standard form, $ax + by = c$, where a, b, and c are integers, and a is not negative.

3. Write an equation in slope-intercept form that represents the line shown.



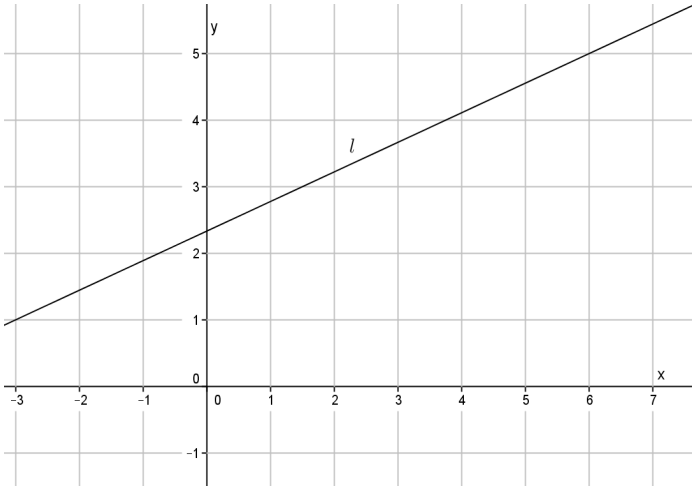
4. Use the properties of equality to change the equation you wrote for Problem 3 from slope-intercept form, $y = mx + b$, to standard form, $ax + by = c$, where a, b, and c are integers, and a is not negative.

Name _____ Date _____

Lesson 21: Some Facts About Graphs of Linear Equations in Two Variables

Exit Ticket

1. Write the equation for the line l shown in the figure below.



2. A line goes through the point $(5, -7)$ and has slope $m = -3$. Write the equation that represents the line.

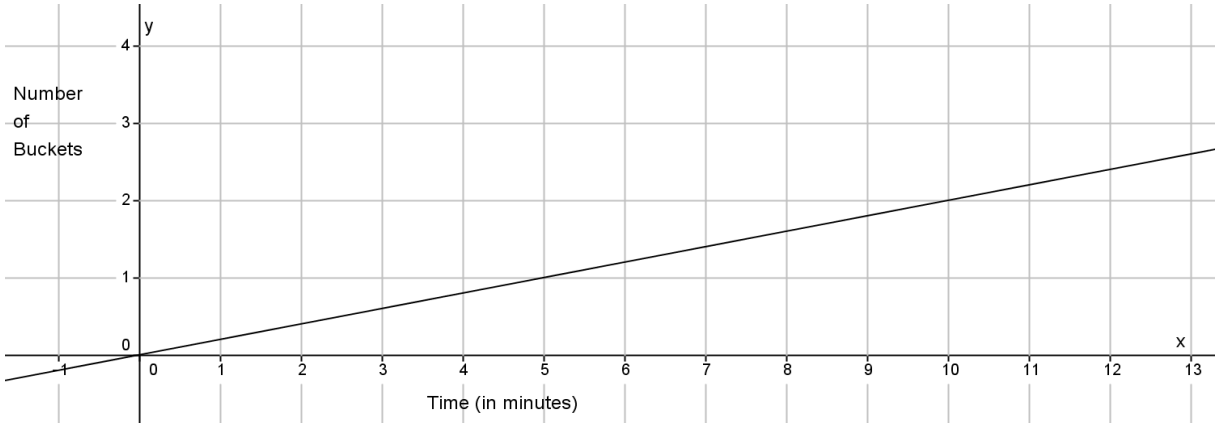
Name _____ Date _____

Lesson 22: Constant Rates Revisited

Exit Ticket

1. Water flows out of Pipe A at a constant rate. Pipe A can fill 3 buckets of the same size in 14 minutes. Write a linear equation that represents the situation.

2. The figure below represents the rate at which Pipe B can fill the same-sized buckets.



Which pipe fills buckets faster? Explain.

Name _____ Date _____

Lesson 23: The Defining Equation of a Line

Exit Ticket

1. Do the graphs of the equations $-16x + 12y = 33$ and $-4x + 3y = 8$ graph as the same line? Why or why not?

2. Given the equation $3x - y = 11$, write another equation that will have the same graph. Explain why.

Name _____ Date _____

Lesson 24: Introduction to Simultaneous Equations

Exit Ticket

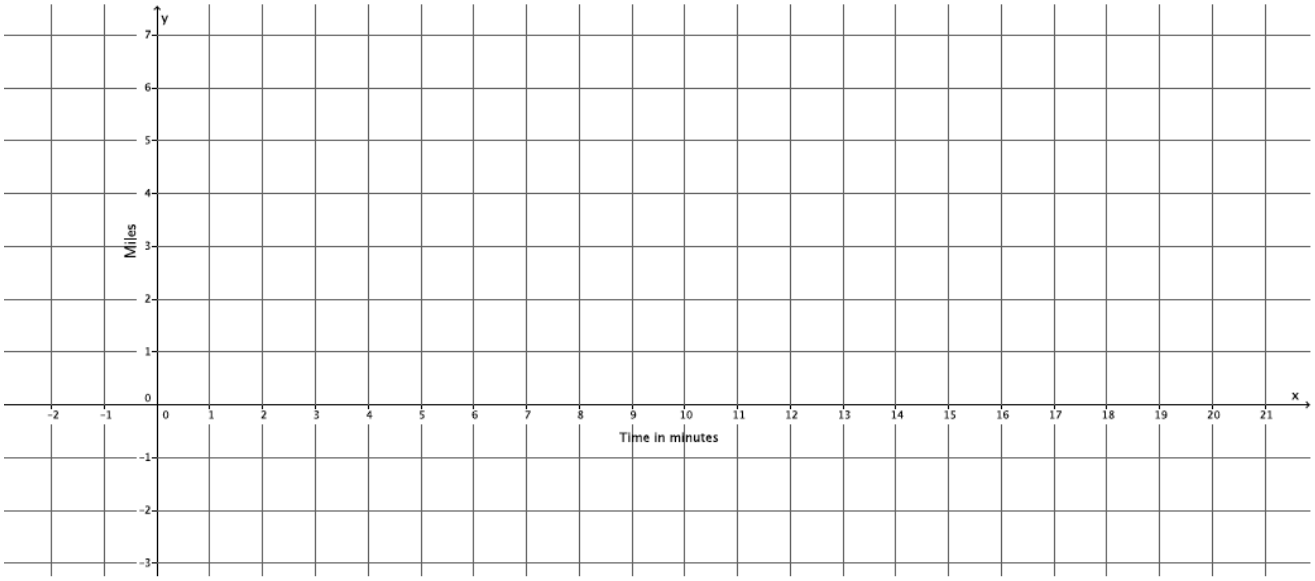
Darnell and Hector ride their bikes at constant speeds. Darnell leaves Hector's house to bike home. He can bike the 8 miles in 32 minutes. Five minutes after Darnell leaves, Hector realizes that Darnell left his phone. Hector rides to catch up. He can ride to Darnell's house in 24 minutes. Assuming they bike the same path, will Hector catch up to Darnell before he gets home?

a. Write the linear equation that represents Darnell's constant speed.

b. Write the linear equation that represents Hector's constant speed. Make sure to take into account that Hector left after Darnell.

c. Write the system of linear equations that represents this situation.

d. Sketch the graphs of the two equations.



e. Will Hector catch up to Darnell before he gets home? If so, approximately when?

f. At approximately what point do the graphs of the lines intersect?

Name _____ Date _____

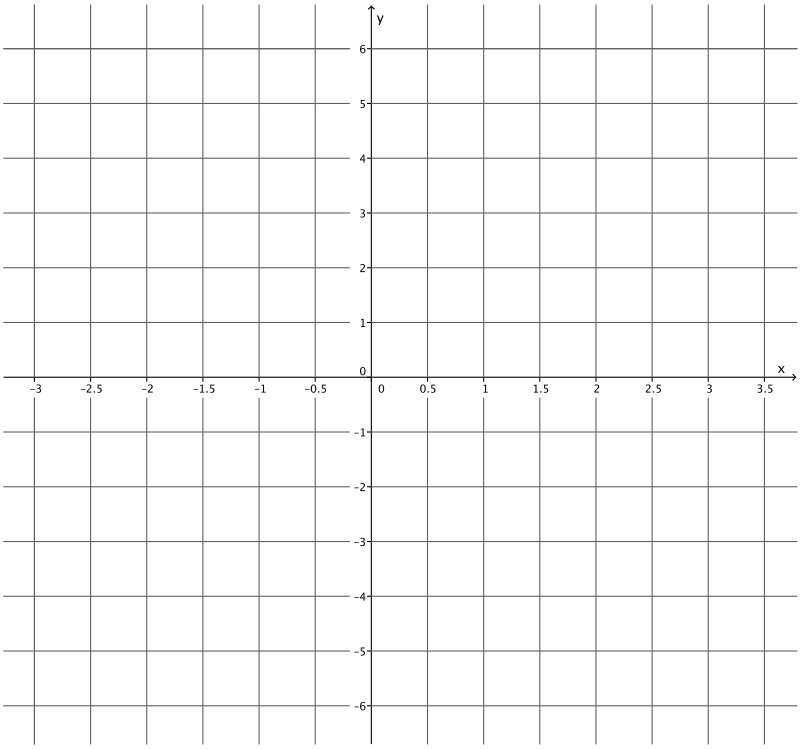
Lesson 25: Geometric Interpretation of the Solutions of a Linear System

Exit Ticket

Sketch the graphs of the linear system on a coordinate plane: $\begin{cases} 2x - y = -1 \\ y = 5x - 5 \end{cases}$.

a. Name the ordered pair where the graphs of the two linear equations intersect.

b. Verify that the ordered pair named in part (a) is a solution to $2x - y = -1$.



c. Verify that the ordered pair named in part (a) is a solution to $y = 5x - 5$.

Name _____ Date _____

Lesson 26: Characterization of Parallel Lines

Exit Ticket

Does each system of linear equations have a solution? Explain your answer.

1. $\begin{cases} y = \frac{5}{4}x - 3 \\ y + 2 = \frac{5}{4}x \end{cases}$

2. $\begin{cases} y = \frac{2}{3}x - 5 \\ 4x - 8y = 11 \end{cases}$

3. $\begin{cases} \frac{1}{3}x + y = 8 \\ x + 3y = 12 \end{cases}$

Name _____ Date _____

Lesson 27: Nature of Solutions of a System of Linear Equations

Exit Ticket

Determine the nature of the solution to each system of linear equations. If the system has a solution, then find it without graphing.

1. $\begin{cases} y = \frac{1}{2}x + \frac{5}{2} \\ x - 2y = 7 \end{cases}$

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

3. $\begin{cases} y = 3x - 2 \\ -3x + y = -2 \end{cases}$

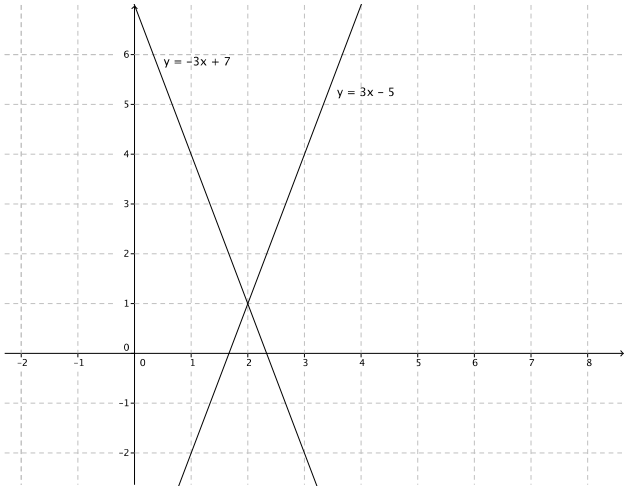
Name _____ Date _____

Lesson 28: Another Computational Method of Solving a Linear System

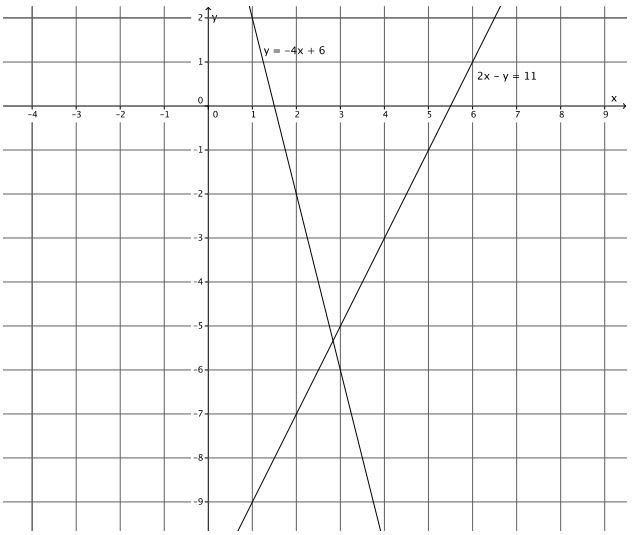
Exit Ticket

Determine the solution, if it exists, for each system of linear equations. Verify your solution on the coordinate plane.

1. $\begin{cases} y = 3x - 5 \\ y = -3x + 7 \end{cases}$



2. $\begin{cases} y = -4x + 6 \\ 2x - y = 11 \end{cases}$



Name _____ Date _____

Lesson 29: Word Problems

Exit Ticket

1. Small boxes contain DVDs, and large boxes contain one gaming machine. Three boxes of gaming machines and a box of DVDs weigh 48 pounds. Three boxes of gaming machines and five boxes of DVDs weigh 72 pounds. How much does each box weigh?

2. A language arts test is worth 100 points. There is a total of 26 questions. There are spelling word questions that are worth 2 points each and vocabulary word questions worth 5 points each. How many of each type of question are there?

Name _____ Date _____

Lesson 30: Conversion Between Celsius and Fahrenheit

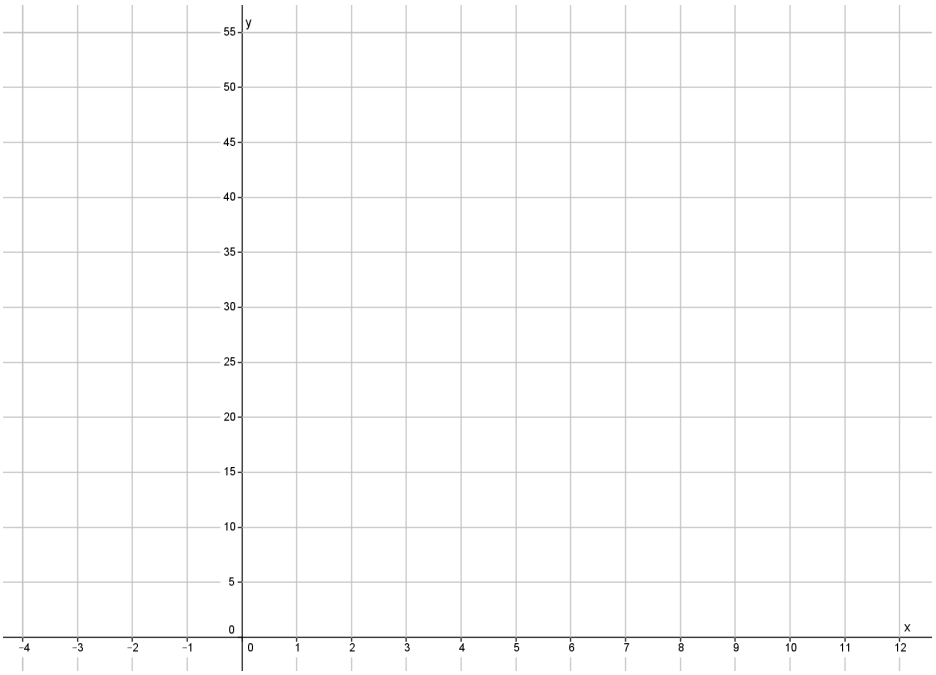
Exit Ticket

Use the equation developed in class to answer the following questions:

1. How many degrees Fahrenheit is $11°C$?

2. How many degrees Fahrenheit is $-3°C$?

3. Graph the equation developed in class, and use it to confirm your results from Problems 1 and 2.



Name _____ Date _____

Lesson 31: System of Equations Leading to Pythagorean Triples

Exit Ticket

Use a calculator to complete Problems 1–3.

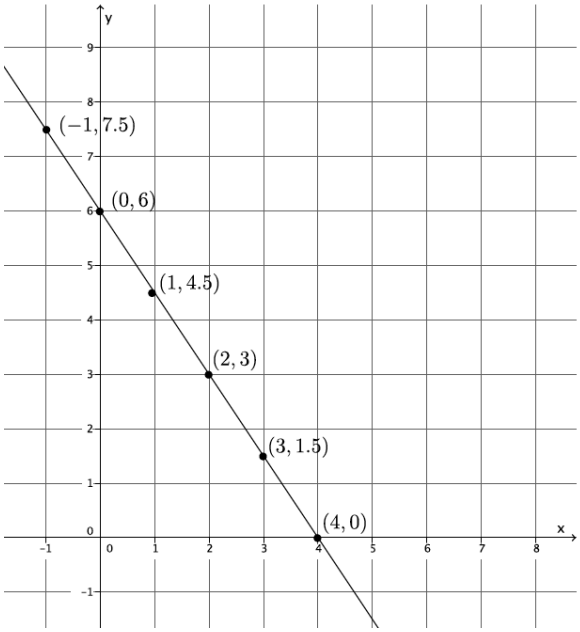
1. Is $7, 20, 21$ a Pythagorean triple? Is $1, \frac{15}{8}, \frac{17}{8}$ a Pythagorean triple? Explain.

2. Identify two Pythagorean triples using the known triple $9, 40, 41$.

3. Use the system $\begin{cases} x + y = \frac{t}{s} \\ x - y = \frac{s}{t} \end{cases}$ to find Pythagorean triples for the given values of $s = 2$ and $t = 3$. Recall that the solution in the form of $\left(\frac{c}{b}, \frac{a}{b}\right)$ is the triple a, b, c. Verify your results.

Name _____ Date _____

1. Use the graph below to answer parts (a)–(c).



a. Use any pair of points to calculate the slope of the line.

b. Use a different pair of points to calculate the slope of the line.

c. Explain why the slopes you calculated in parts (a) and (b) are equal.

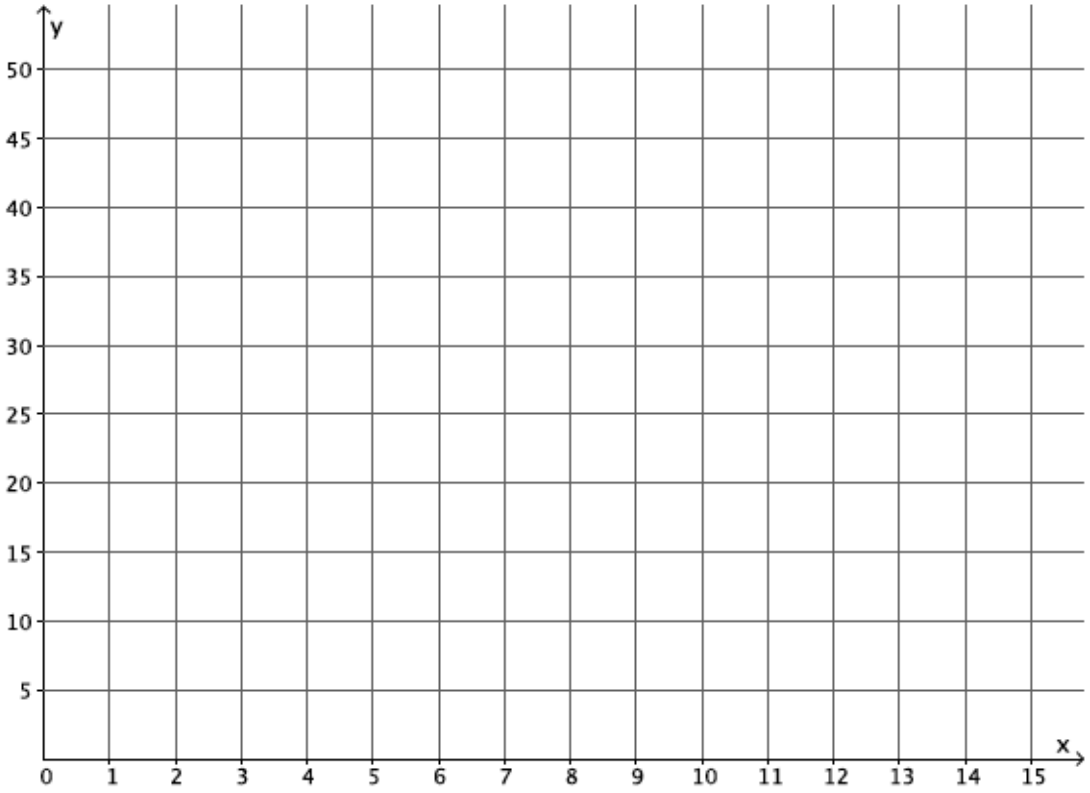
2. Jeremy rides his bike at a rate of 12 miles per hour. Below is a table that represents the number of hours and miles Kevin rides. Assume both bikers ride at a constant rate.

Time in Hours (x)	Distance in Miles (y)
1.5	17.25
2	23
3.5	40.25
4	46

a. Which biker rides at a greater speed? Explain your reasoning.

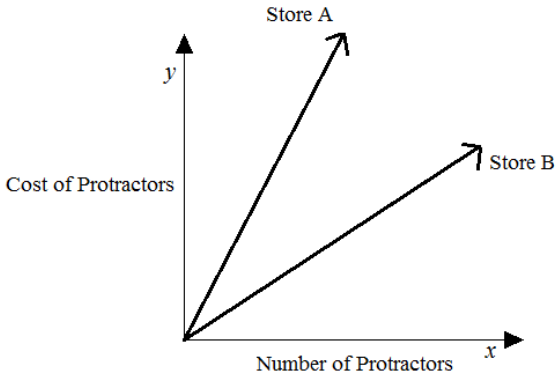
b. Write an equation for a third biker, Lauren, who rides twice as fast as Kevin. Use y to represent the number of miles Lauren travels in x hours. Explain your reasoning.

c. Create a graph of the equation in part (b).



d. Calculate the slope of the line in part (c), and interpret its meaning in this situation.

3. The cost of five protractors is $\$14.95$ at Store A. The graph below compares the cost of protractors at Store A with the cost at Store B.



Estimate the cost of one protractor at Store B. Use evidence from the graph to justify your answer.

4. Given the equation $3x + 9y = -8$, write a second linear equation to create a system that:

   a. Has exactly one solution. Explain your reasoning.

   b. Has no solution. Explain your reasoning.

   c. Has infinitely many solutions. Explain your reasoning.

   d. Interpret the meaning of the solution, if it exists, in the context of the graph of the following system of equations.

$$\begin{cases} -5x + 2y = 10 \\ 10x - 4y = -20 \end{cases}$$

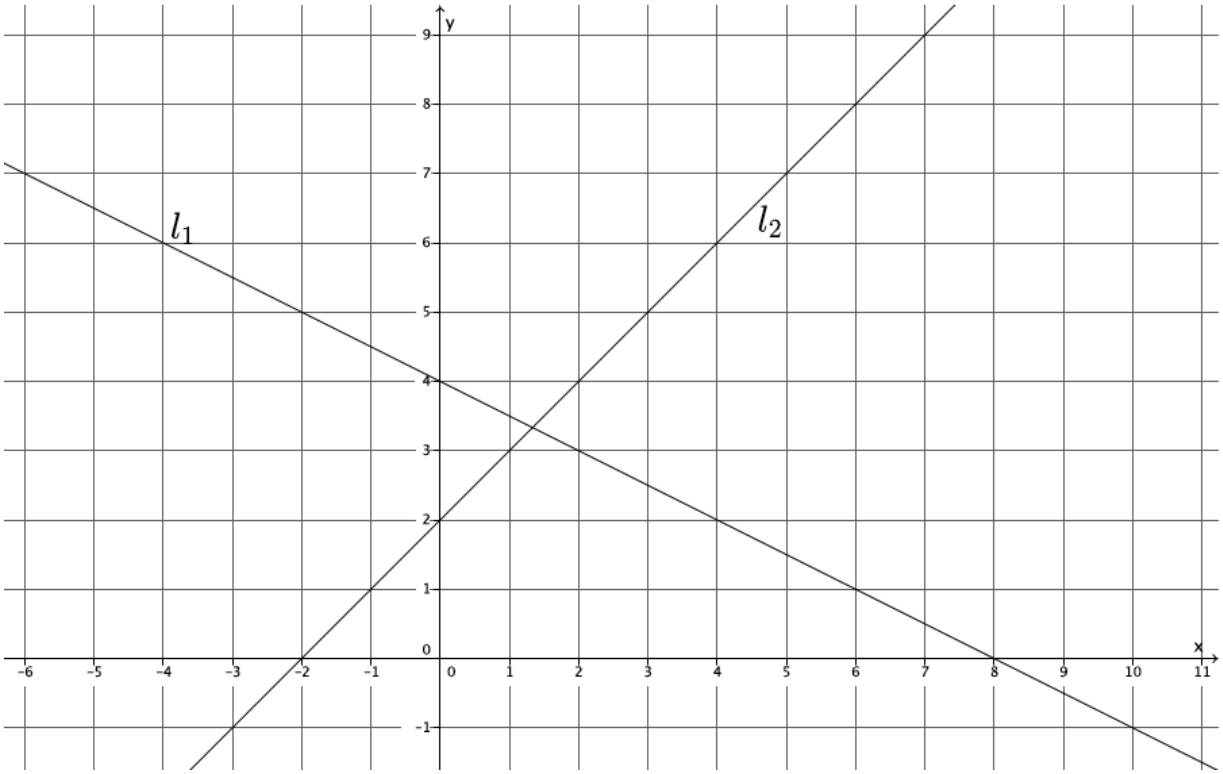
5. Students sold 275 tickets for a fundraiser at school. Some tickets are for children and cost \$3, while the rest are adult tickets that cost \$5. If the total value of all tickets sold was \$1,025, how many of each type of ticket was sold?

6.

a. Determine the equation of the line connecting the points $(0, -1)$ and $(2, 3)$.

b. Will the line described by the equation in part (a) intersect the line passing through the points $(-2, 4)$ and $(-3, 3)$? Explain why or why not.

7. Line l_1 and line l_2 are shown on the graph below. Use the graph to answer parts (a)–(f).



a. What is the y-intercept of l_1?

b. What is the y-intercept of l_2?

c. Write a system of linear equations representing lines l_1 and l_2.

d. Use the graph to estimate the solution to the system.

e. Solve the system of linear equations algebraically.

f. Show that your solution from part (e) satisfies both equations.