MPM 1D Handout
Unit 4 Test Review

Date: **Name:**

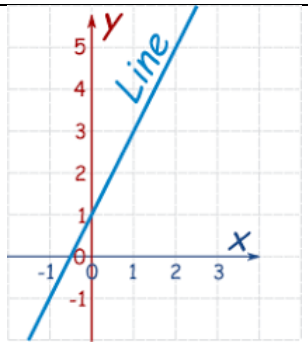
Important Stuff to Remember:

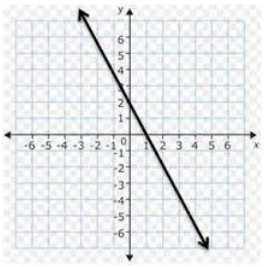
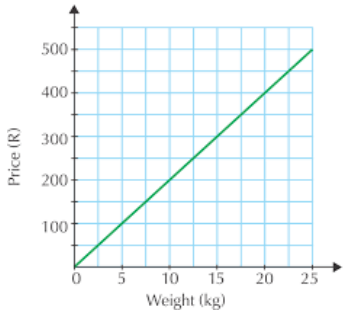
- There are FOUR ways to represent a relation:
  - Words (description)
  - Equation
  - Table
  - Graph
- We need to identify direct and partial variation, initial value, and slope given any one of these forms.
- Slope can be a ratio or a rate depending on the context of the question.
- When finding slope on a graph, use exact points and be mindful of units!
- To change forms of an equation, rearrange. Remember that 'A' in standard form cannot be a negative value or a fraction!
- We can graph a linear relation using a table of values (plugin values for x to get values for y, plot the points).
- We can graph using an equation in y = mx + b form (plot b, then count the rise and the run from b to get another point).
- We can graph a linear relation by finding its intercepts.
  - To get y-intercept, let x = 0.
  - To get x – intercept, let y = 0.
  - Plot both points and connect them.
- To write the equation of a linear relationship we need to know the slope and the y-intercept.
- Find the equation in slope y – intercept form (y = mx + b) and then rearrange to standard from if you are asked to (Ax + By + C = 0).
- The solution to a linear system of equations is just their point of intersection.

Part 1: Direct and Partial Variation

1. For each linear relation below, state:
   a. the type of variation and how you knew.
   b. the initial value and whether the rate of change is positive or negative.

Number of Nintendo games rented	Total Cost
0	$20
5	30
10	40
15	50
20	60
25	70



	
A car's gas tank hold 40L of fuel. While driving on the highway, the volume decreases by 10L per 100 km.	A canoe rental company charges $40 to rent the canoe and $5 per hour of use.

2. Write a description for a linear relationship with:
    a. Direct variation.

    b. Partial variation.

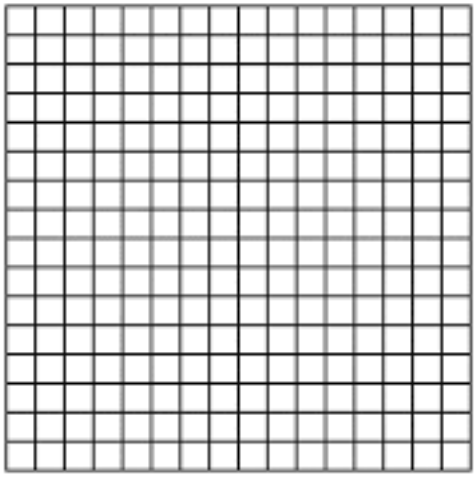
<u>Part 2: Representations of Linear Relations</u>

1. Given the table below, create a graph, equation, and description for the situation.

Table:

Time, t (min)	Distance (m)
0	800
3	650
6	500
9	350
12	100

Graph:



Description:

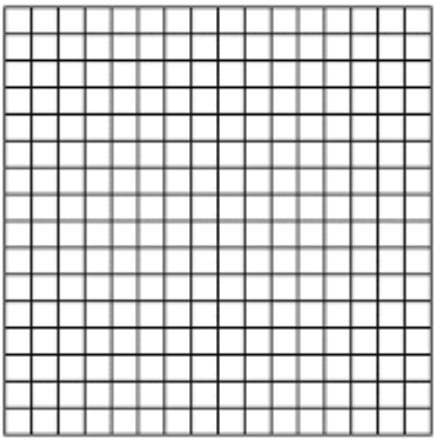
Equation:

2. To go on a school trip to an amusement park, the bus rental costs $250, and then each student must pay $25 to enter the park.
    a. What is the initial cost of this trip? What is the rate of change in the cost of the trip?

    b. Complete the table of values, graph and equation for this relationship.

Number of Students	Cost ($)
0	250
25	
50	2750
75	

Equation:

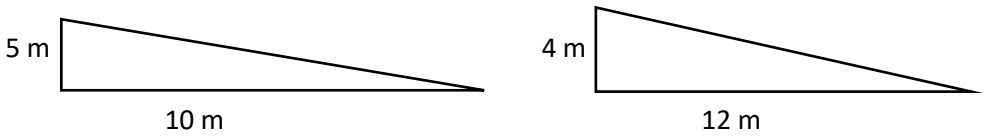


    c. How much would it cost for 142 students to attend this trip? Which representation did you choose to use to find this value, and why?

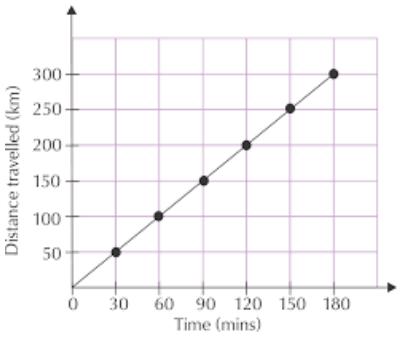
    d. How many students could go on the trip if they have $875 to pay for it? Which representation did you use to find this value and why?

<u>Part 3: Slope, Rate of Change, and First Differences</u>

1. Determine the slope of each ramp shown below. For a ramp to be considered safe it must have a slope that is less than 0.45. Which of the ramps is safe?

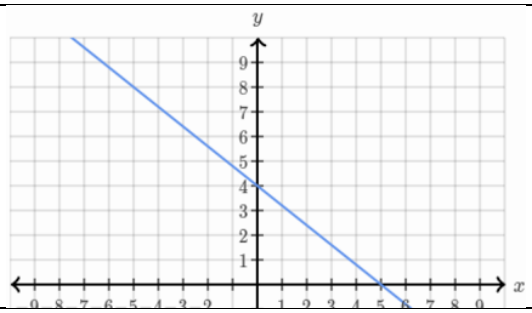


2. Determine the slope for each of the linear relationships provided below.



x	*y*
-1	3
0	5
1	7
2	9

x	y
-2	10
-1	4
0	-2
1	-8
2	-14



A pizza place charges $12 for a medium pizza plus $0.85 per topping.

A person walks at a constant speed of 5 km/h.

3. State the initial value for the relations in question 2, and write an equation to model each one.

4. On a graph, how do we know if a line has a positive slope or a negative slope?

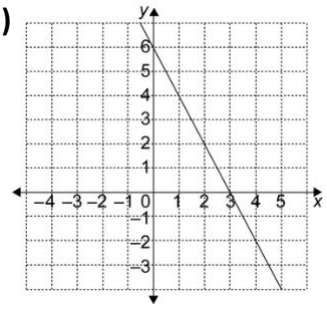
5. What type of lines have a slope of zero? What type of lines have an undefined slope? Explain.

6. The general equation for all linear relationships is y = mx + b. Explain what m and b mean in real life terms. Use an example to support your explanation.

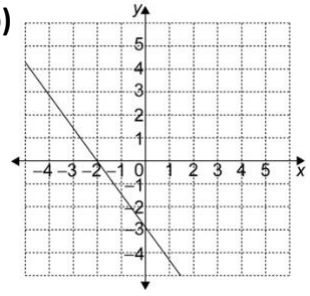
Part 3: Equations of Lines

1. Find the slope and *y*-intercept of each line. Then write the equation in both slope y-intercept and standard form.

a)

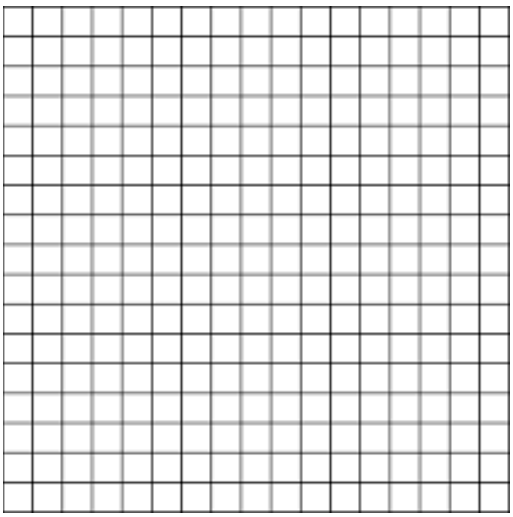


b)



2. Identify the slope and *y*-intercept of each line and use them to graph each line. Then write the equations in standard form.
   a. $y = 4x - 5$

   b. $y = -\frac{1}{6}x + 2$



3. Write the equation of a line with each slope and *y*-intercept. Then, graph each line on the grid on the previous page.

a) $m = -1$, $b = 0$ **b)** $m = \frac{2}{3}$, $b = 5$

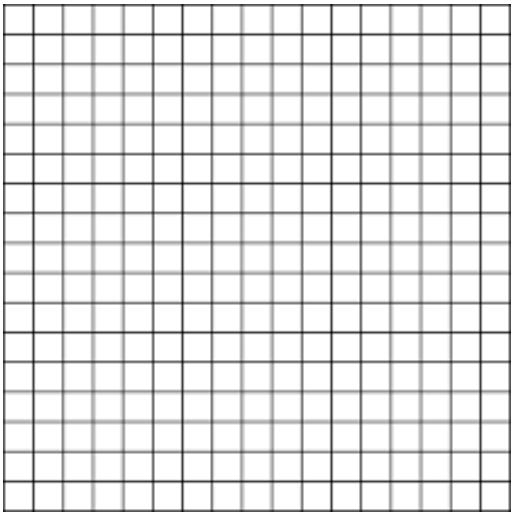
4. Express each equation in the form $y = mx + b$.

a) $6x - y - 4 = 0$ b) $x + 4y = 28$

5. Identify the *x*- and *y*-intercepts of each line. Then, graph the line using the grid on the next page.

a) $4x - 2y = 8$ **b)** $x + 3y = 6$

c) $2x - y = 4$ **d)** $5x + 3y - 15 = 0$



6. Which lines are parallel? (Write in slope y-intercept form!)
   a) $2x - 3y + 12 = 0$
   c) $3y = 2x + 6$
   b) $3x - 2y = 0$
   d) $3x + 2y = -4$

7. Which lines in question 6 are perpendicular? How do you know?

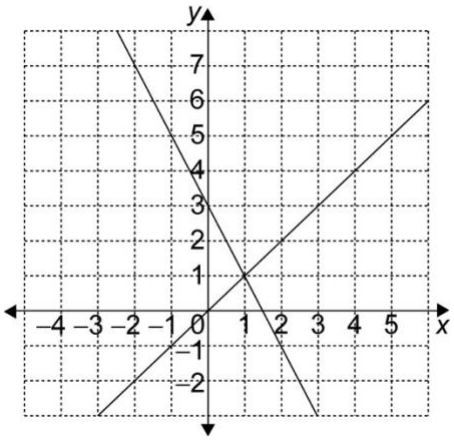
8. Find the equation of a line with a slope of –3, passing through (2, –5) in slope y-intercept form.

9. Find the equation of a line parallel to y = -3x + 7 that passes through (-9, 6) in standard form.

10. Find the equation for a line passing through (3, –4) and (2, 5) in standard form.

11. Find the equation of a line perpendicular to y = ½ x + 5 that has an x-intercept of -7 in slope y-intercept form.

12. What is the solution to this linear system?



13. Solve the linear system by graphing.

$x + y = 6$ and $y - 2x = 0$