

**Math 10-C Linear Equations & Graphs Assignment List Name:** \_\_\_\_\_

**C1: Linear Relations**

- CP Handout pg. 153
- Slope as a Rate of Change Assignment
- Slope Graphic Organizer
- Linear or Non-linear Investigation

**C2: Graphing Lines**

- CP Handout pg. 150,151
- Investigating Lines Handout
- CP Handout pg. 155,157
- Instruction Manual (Explain a Process)
- A Straight-Line Landmark
- C1-C2 Quick Check

**C3: Determine Equation of Lines**

- pg. 143: 3ace,5,12
- CP Handout pg. 159,160
- Determine Equations Assignment
- Text pg. 152: 5
- Text pg. 148: 6,7

**C4: Parallel & Perpendicular Lines**

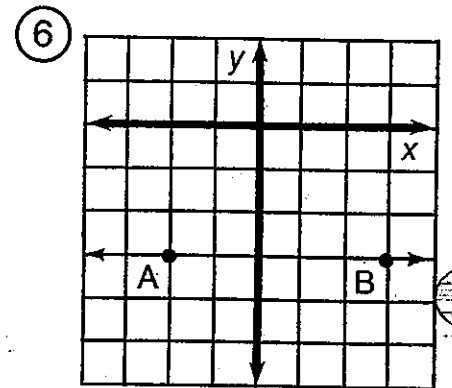
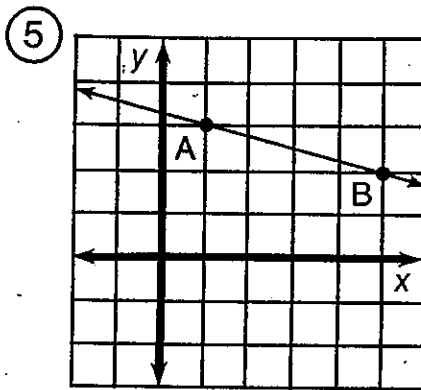
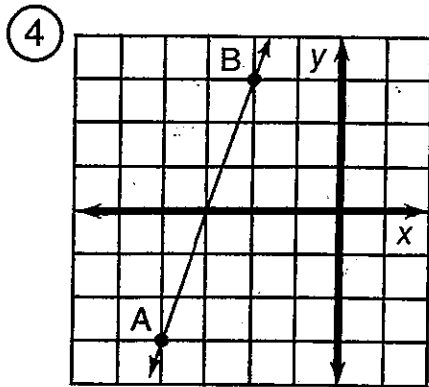
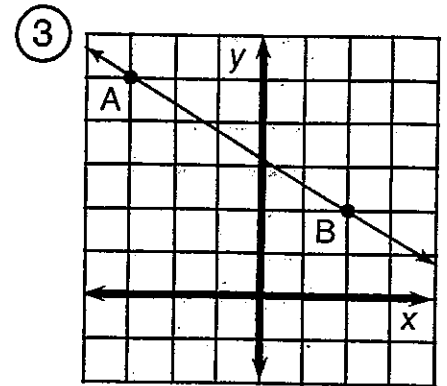
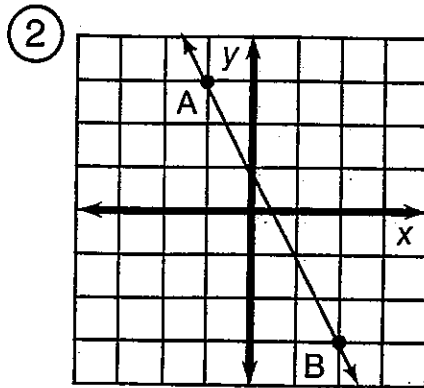
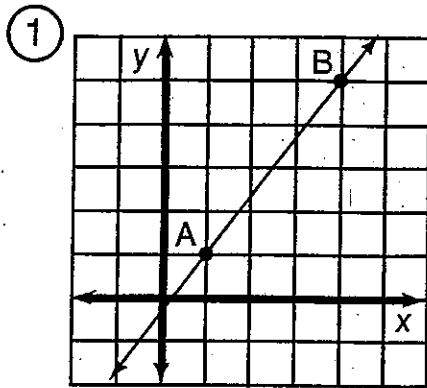
- Parallel & Perpendicular Lines Investigation
- Text pg. 156: 2,6-10,12
- C3-C4 Quick Check

**Linear Equations & Graphs Chapter Review**

- Holt's Hundred Linear Functions Review
- Text pg. 135: 10
- Text pg. 158: 1-14

# What Do You Call a Duck That Steals ?

For the first six exercises, find the slope of the line  $\overleftrightarrow{AB}$ . For the remaining exercises, find the slope of the line that passes through the two given points. Cross out each box in the rectangle below that contains a correct answer. When you finish, print the letters from the remaining boxes in the spaces at the bottom of the page.



⑦ (2, 1); (5, 3)

⑪ (9, 2); (3, -1)

⑮ (-4, -8); (-2, 0)

⑧ (8, 3); (2, 5)

⑫ (-5, 8); (-4, 2)

⑯ (-3, -3); (0, 0)

⑨ (1, -4); (6, -2)

⑬ (0, -1); (4, -7)

⑰ (2, 5); (9, 1)

⑩ (-3, 1); (-7, 4)

⑭ (1, -1); (-2, -6)

⑱ (0, 0); (-2, 7)

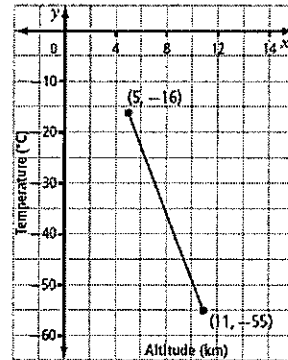
DU	AB	CK	ST	AR	IG	AT	OB	IG	ET	BE	ST
0	-6	$-\frac{3}{5}$	$-\frac{4}{7}$	9	$\frac{1}{2}$	$-\frac{7}{2}$	$-\frac{7}{6}$	$\frac{4}{3}$	$\frac{2}{3}$	$-\frac{5}{4}$	$\frac{5}{3}$
CA	RD	RI	CH	UC	RI	ME	AQ	UA	KY	ET	CK
$\frac{2}{5}$	$\frac{1}{6}$	$-\frac{1}{4}$	-2	-8	$-\frac{3}{2}$	1	$-\frac{1}{3}$	$-\frac{3}{4}$	$\frac{8}{5}$	4	3

OBJECTIVE 5-h: To find the slope of a line given two points on the line (not using the graph).

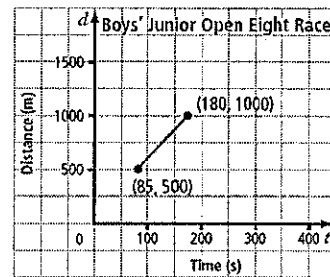
Lin Eqs & Graphs C1-Linear Relations  
Slope as a Rate of Change Assignment

Name: \_\_\_\_\_

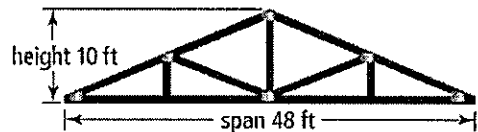
1. The graph shows the air temperature at different altitudes above Earth's surface. Determine the average rate of change. (MHR pg. 326)



2. The Brentwood Regatta in Mill Bay, BC, is the largest junior rowing regatta hosted by a single school in North America. The races are all 1500 m in length. The graph shows the approximate times at the 500-m marks and the 1000-m mark for one of the boy's races. Determine the average rate of change for this portion of the race. (MHR pg. 323)



3. When discussing a roof truss, carpenters refer to the span instead of the width. They talk about the pitch rather than the slope. Determine the pitch of the roof supported by the truss shown. (MHR pg. 320)



4. The Penny Ice Cap glacier in Auyuittuq National Park on Baffin Island, NU is melting. In 2009, some areas of the glacier were about 1000 ft thick. It is estimated that if the glacier continues to melt at its current rate, the ice cap could be 967 ft thick by 2020. What is the estimated rate of change in thickness? (MHR pg. 327)
5. On the first day of school in September, Jodi measured the length of her hair. She found that her longest hair was 36 cm. At the end of the school year, in June, Jodi measured her hair again. Her longest hair at this time was 48.5 cm. What is the average rate of change of hair length per month? (MHR E&H pg. 133)

Definition:

Classify Slopes:

Slope

is

Slope from a Graph:

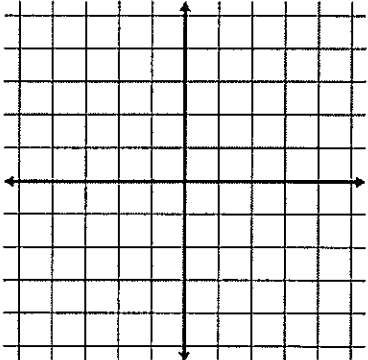
Slope from a  
Formula:

**M10C Lin Eqs & Graphs C1 – Linear Relations**  
 Linear or Non-Linear Investigation

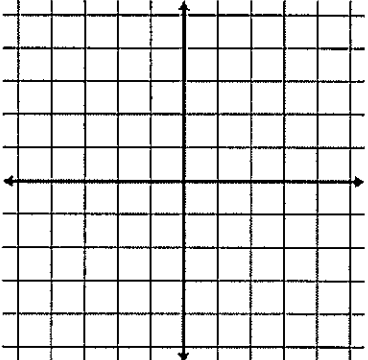
Name: \_\_\_\_\_

*In each of the problems you will be given a relation as an equation. Graph the given relation by creating a table of values using the given domain. Then state the range of the relation, determine if the relation is linear or non-linear and calculate the slope (if relation is linear).*

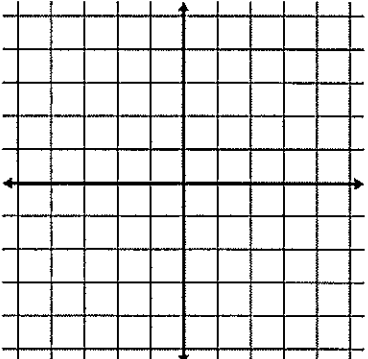
**Problem #1**

<b>Equation:</b> $y = 2x$	<b>Table of Values</b>	<b>Graph</b> 
<b>Domain:</b> $\{x \mid -2 \leq x \leq 2, x \in R\}$		
<b>Range:</b>		
<b>Linear or Non-Linear</b> (Circle One)		
<b>Slope:</b> (If linear)		

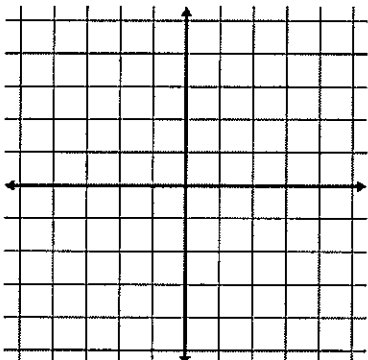
**Problem #2**

<b>Equation:</b> $y = x^2$	<b>Table of Values</b>	<b>Graph</b> 
<b>Domain:</b> $\{x \mid -2 \leq x \leq 2, x \in R\}$		
<b>Range:</b>		
<b>Linear or Non-Linear</b> (Circle One)		
<b>Slope:</b> (If linear)		

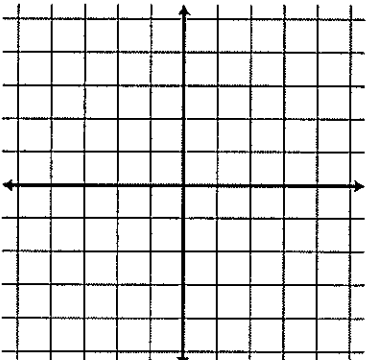
**Problem #3**

<b>Equation:</b> $y = \sqrt{x}$	<b>Table of Values</b>	<b>Graph</b> 
<b>Domain:</b> $\{x \mid x \geq 0, x \in R\}$		
<b>Range:</b>		
<b>Linear or Non-Linear</b> (Circle One)		
<b>Slope:</b> (If linear)		

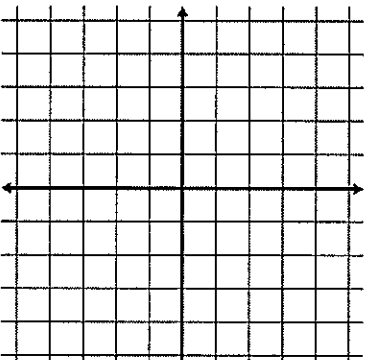
**Problem #4**

<b>Equation:</b> $y = \frac{1}{2}x - 2$	<b>Table of Values</b>	<b>Graph</b> 
<b>Domain:</b> $\{-3, -2, -1, 0, 1, 2, 3\}$		
<b>Range:</b>		
<b>Linear or Non-Linear</b> (Circle One)		
<b>Slope:</b> (If linear)		

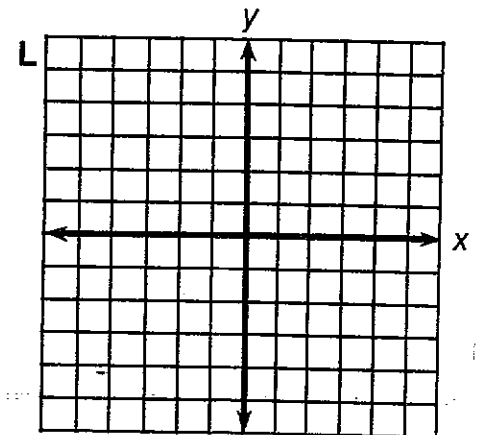
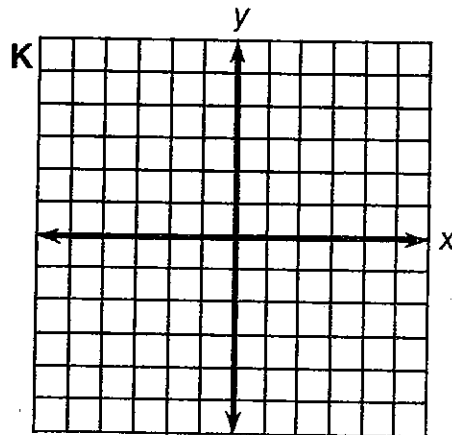
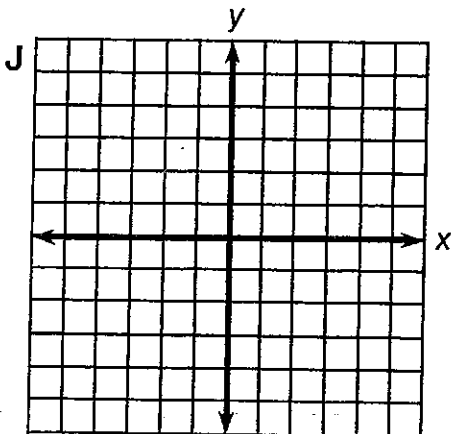
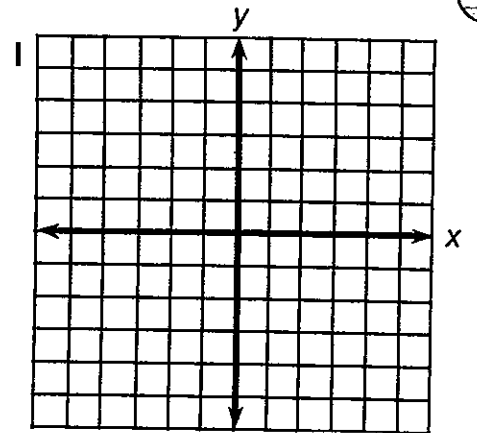
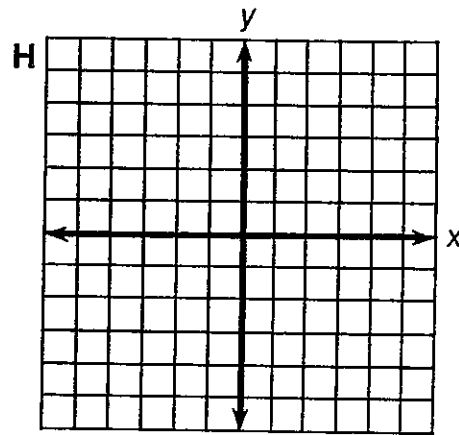
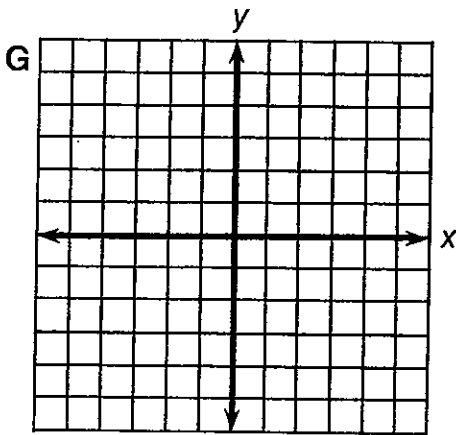
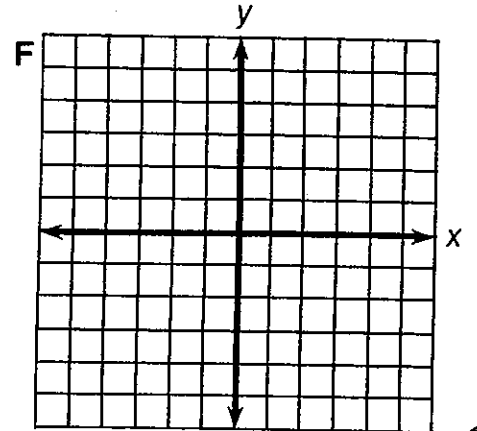
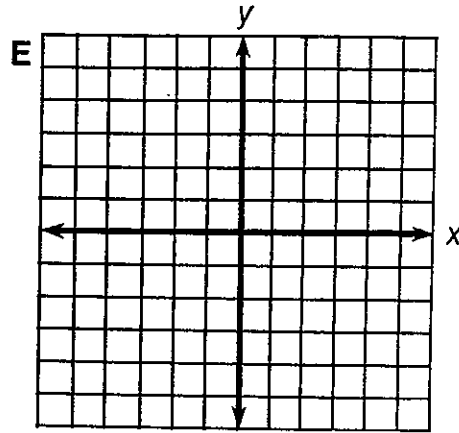
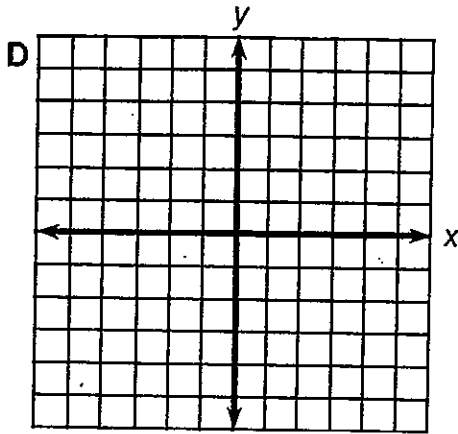
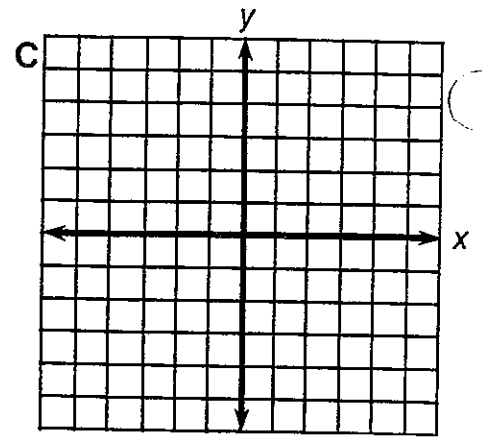
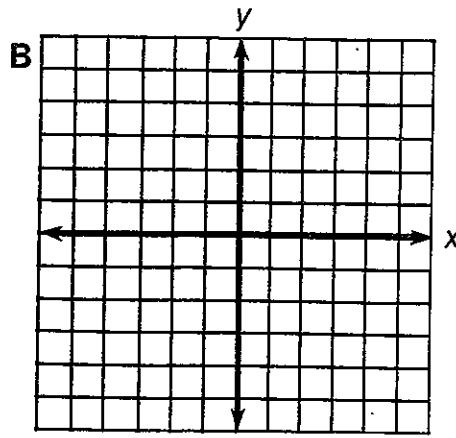
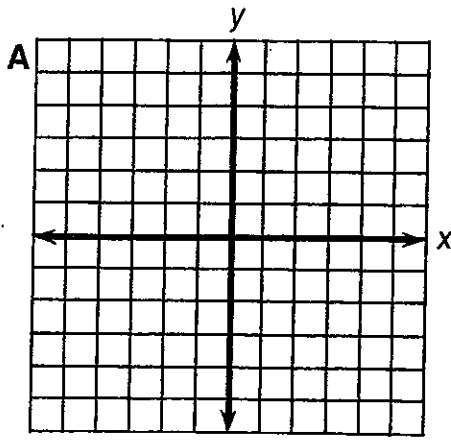
**Problem #5**

<b>Equation:</b> $y = 2^x$	<b>Table of Values</b>	<b>Graph</b> 
<b>Domain:</b> $\{x   x \in R\}$		
<b>Range:</b>		
<b>Linear or Non-Linear</b> (Circle One)		
<b>Slope:</b> (If linear)		

**Problem #6**

<b>Equation:</b> $y = 3$	<b>Table of Values</b>	<b>Graph</b> 
<b>Domain:</b> $\{x   x \in R\}$		
<b>Range:</b>		
<b>Linear or Non-Linear</b> (Circle One)		
<b>Slope:</b> (If linear)		







## Math 10 C: Investigating Lines

Complete the following with a partner.

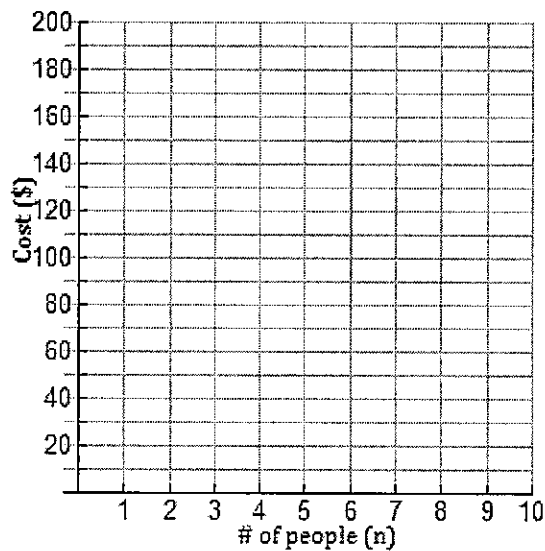
### Part A

1. The cost of a private dinner with a set menu at a restaurant is represented by the equation  $C = 20n$  where  $n$  is the number of people in attendance and  $C$  is the total cost. Complete the partial table of values below. Then, graph the data on the grid provided. Label the graph L1.

$n$	$C$
0	
1	
2	
3	
4	
5	
6	

2. The cost of a different menu is represented by the equation  $C = 30n$  where  $n$  is the number of people in attendance and  $C$  is the total cost. Complete the partial table of values below. Then, graph the data on the same grid as number 1. Label the graph L2.

$n$	$C$
0	
1	
2	
3	
4	
5	
6	



3. Is the function represented by the equations (and graphs) above linear or non-linear? How do you know?
4. How are L1 and L2 different? How are they similar?

5. What would happen to the **graph** if the equation was  $C = 15n$ ?

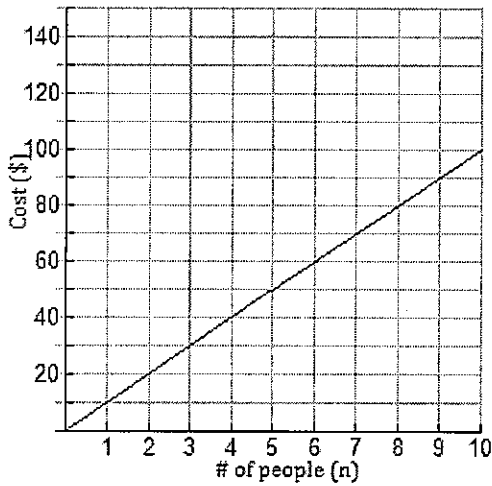
6. (a) What does the number in front of the independent variable represent in this problem?

(b) What does the number in front of the independent variable represent in general?

7. Given the graphs below, determine:

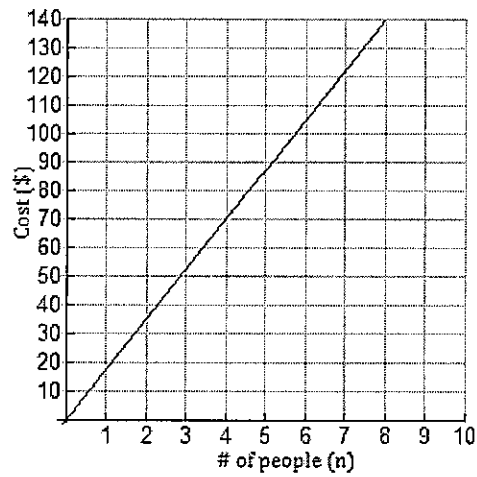
(a) The cost/person

(b) The equation of the line.



(a)

(b)



(a)

(b)

8. How did you find the value in front of the variable in question #7?

9. What if you were told that the cost for 8 people was \$96? What would be the equation of the line?

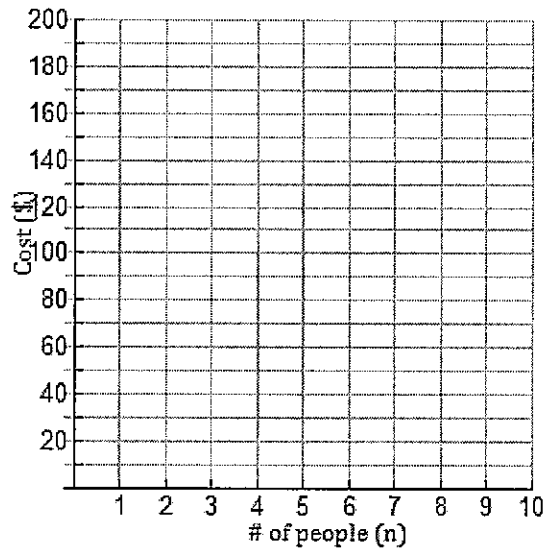
**Part B**

1. The cost of a dinner at another restaurant is represented by the equation  $C = 20n + 50$  where  $n$  is the number of people in attendance and  $C$  is the total cost. Complete the table of values below. Then, graph the data on the grid provided. Label the line L1.

$n$	$C$
0	
1	
2	
3	
4	
5	
6	

2. The cost of a different menu at the same restaurant is represented by the equation  $C = 20n + 70$  where  $n$  is the number of people in attendance and  $C$  is the total cost. Create a table of values below. Then, graph the data on the same grid as number 1. Label the line L2

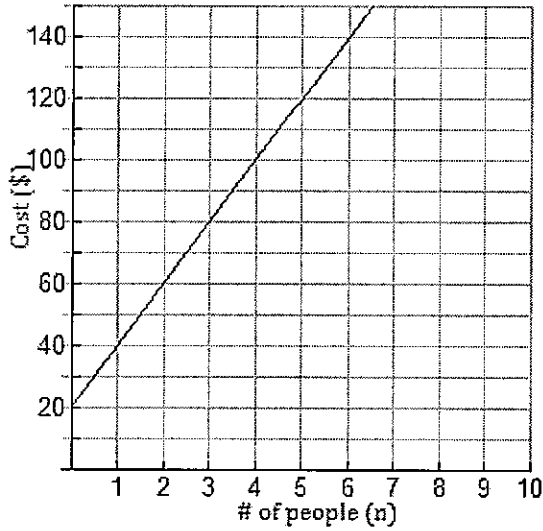
$n$	$C$
0	
1	
2	
3	
4	
5	
6	



3. How are L1 and L2 different? How are they similar?
4. What would happen to the **graph** if the equation was  $C = 20n + 30$ ?

5. What does the constant number (the number NOT multiplied by a variable) in the equation represent?

6. What is the equation of the line shown below? Explain.

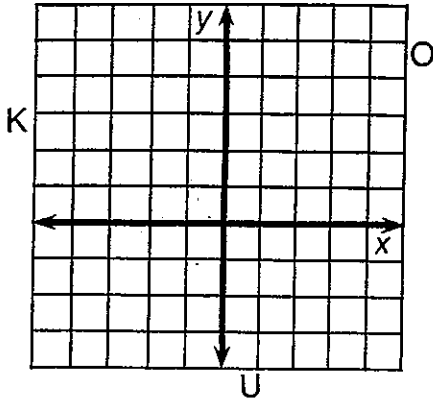


7. What if you were told that the fixed cost of renting a room is \$40 and the cost per person is \$15. Write the equation of the line.

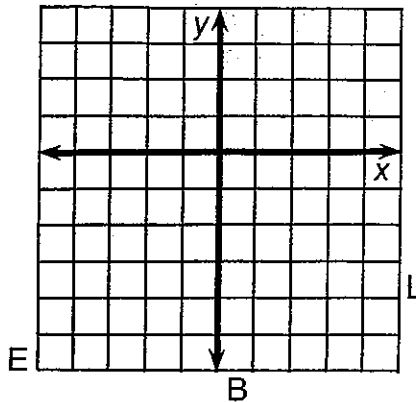
# Whom Should You See at the Bank If You Need To Borrow Money?

Use the slope and  $y$ -intercept to graph each equation below. The graph, if extended, will cross a letter. Print this letter in each box that contains the number of that exercise.

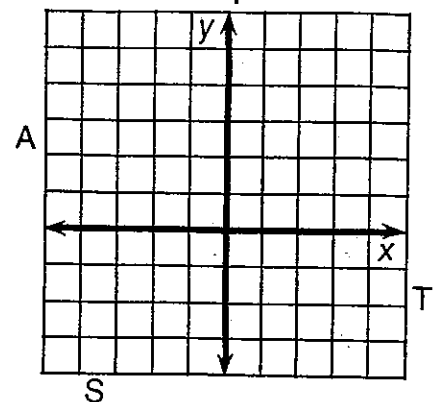
①  $y = \frac{2}{3}x + 1$



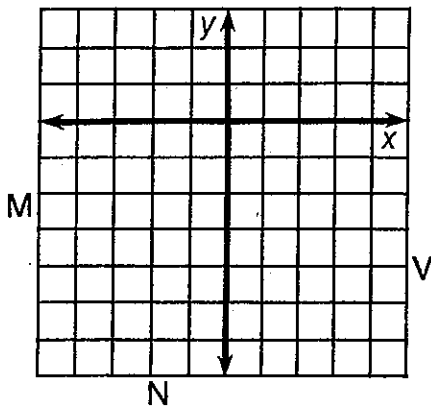
②  $y = \frac{1}{2}x - 3$



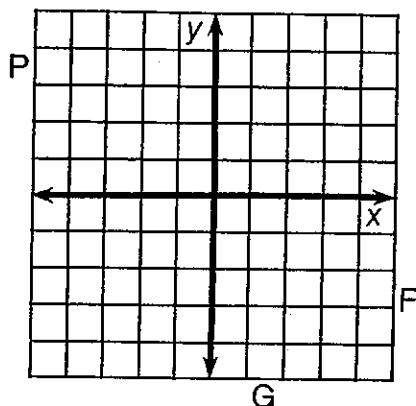
③  $y = -\frac{3}{4}x + 2$



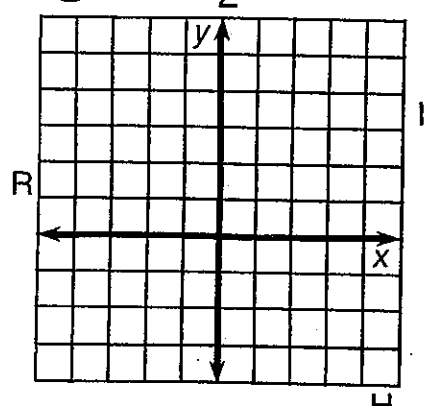
④  $y = 2x - 4$



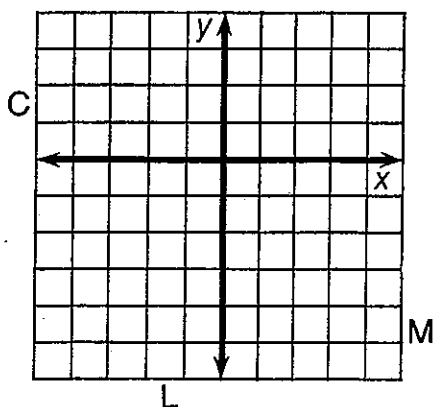
⑤  $y = -3x - 1$



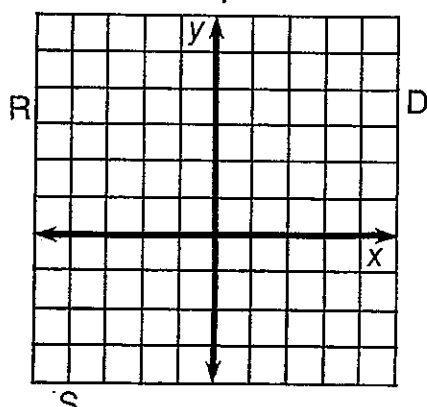
⑥  $y = -\frac{3}{2}x + 3$



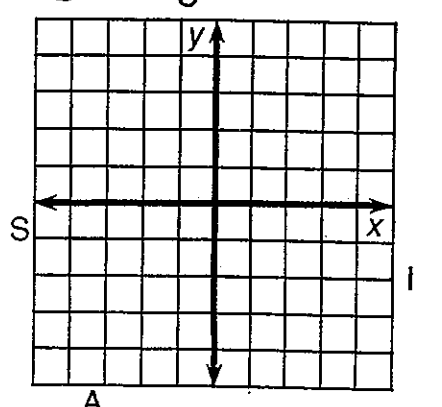
⑦  $y = 4x - 2$



⑧  $y = -\frac{1}{4}x + 2$



⑨  $y = \frac{5}{3}x$

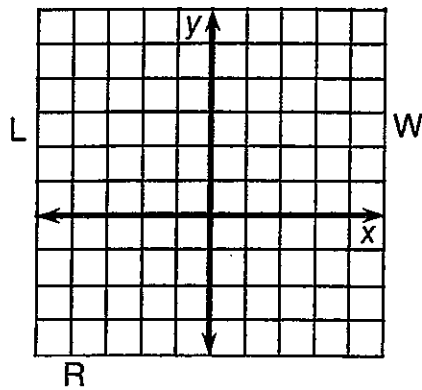


3	6	2	7	1	9	4	9	8	8	9	4	5	2	8
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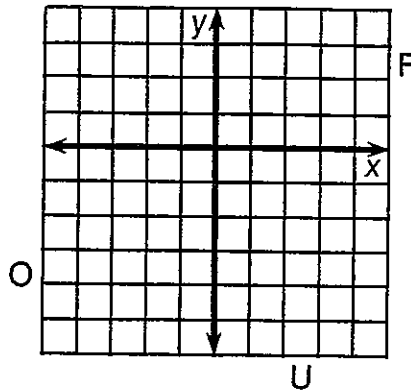
# Why Does a Poor Man Drink Coffee?

Use the slope and  $y$ -intercept to graph each equation below. The graph, if extended, will cross a letter. Print this letter in each box that contains the number of that exercise.

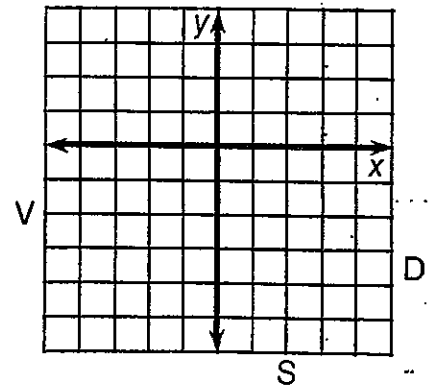
①  $-3x + 2y = 2$



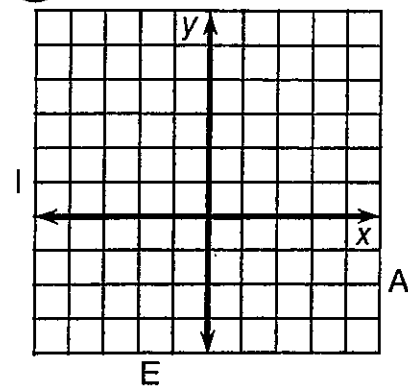
②  $x - 4y = 8$



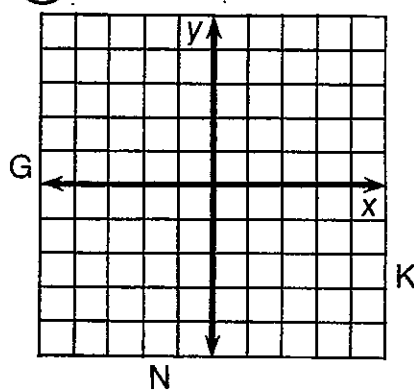
③  $2x + y = -3$



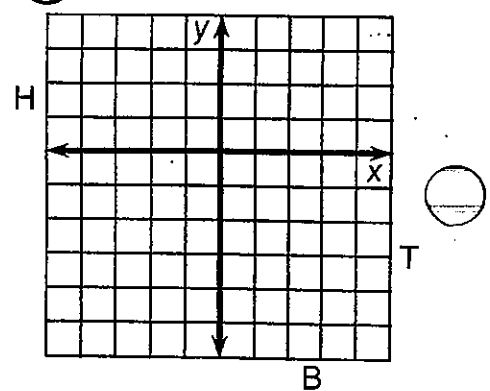
④  $2x + 3y = 6$



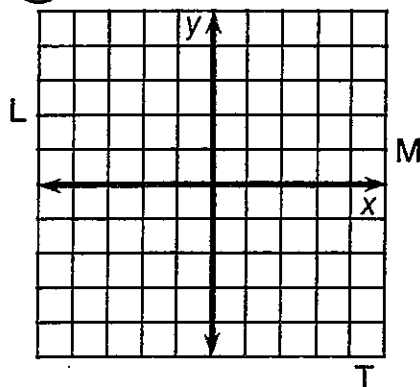
⑤  $3x - y = 1$



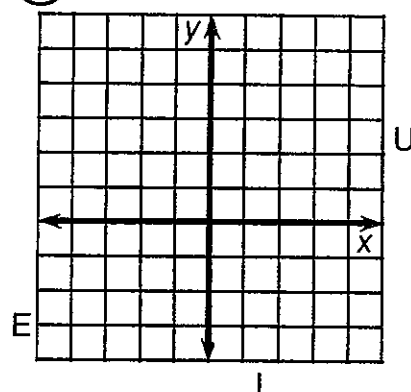
⑥  $-3x - 5y = 10$



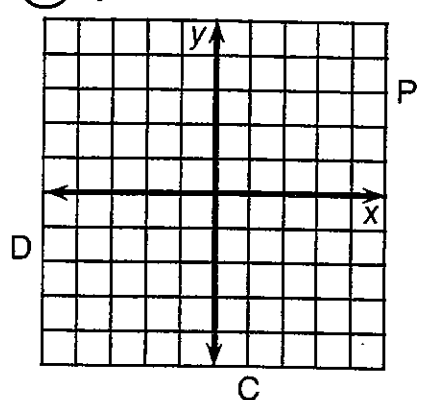
⑦  $4x + 3y = 0$



⑧  $2x - 2y + 5 = 0$



⑨  $y - 3 = 0$



6	8	6	4	3	5	2	9	1	2	9	8	1	7	8	4
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**Instruction Manual (Explain a Process) Activity**  
Linear Equations & Graphs C2

We've discussed in class that there are two main strategies for sketching a graph of a line.

- Strategies to graph a line:
- 1) Calculate x and y intercepts
  - 2) Slope Intercept Form

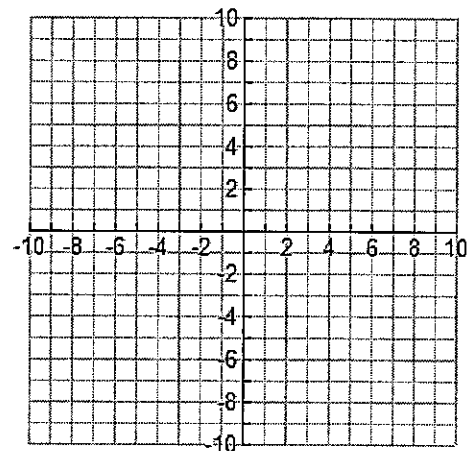
Your task is to create instruction manuals for the strategies listed above.

Your instruction manuals should have step by step instructions and should include an example. The goal is that someone who has never used these strategies before should be able to follow your instructions to solve a problem of their own.

You may work on your own or with a partner. Please hand in your instruction manuals on a separate sheet of paper once you are done. You will have approximately 35 minutes for this.

**Practice:**

Test your instruction manuals by using both strategies to graph  $5x + 3y - 15 = 0$ .



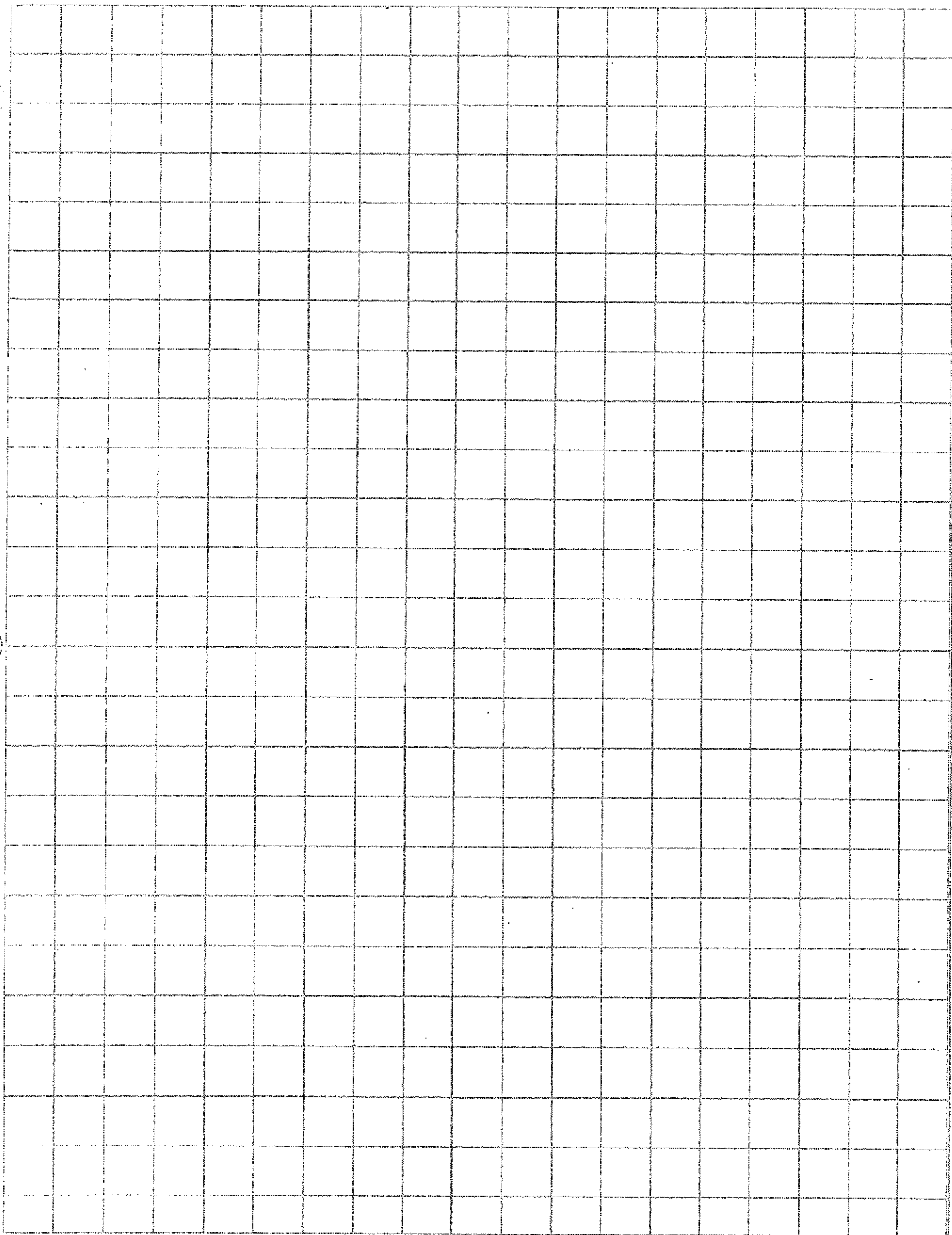
## A Straight-Line Landmark

Draw a set of axes with  $x$  from 0 to 16 and  $y$  from 0 to 25.

Now draw the following straight lines between the given values of  $x$ :

- a)  $y = 2x - 2$  between  $x = 1$  and  $x = 5$
- b)  $y = 4x - 12$  between  $x = 5$  and  $x = 6$
- c)  $y = 11x - 54$  between  $x = 6$  and  $x = 7$
- d)  $y = 2x + 9$  between  $x = 7$  and  $x = 8$
- e)  $y = -2x + 41$  between  $x = 8$  and  $x = 9$
- f)  $y = -11x + 122$  between  $x = 9$  and  $x = 10$
- g)  $y = -4x + 52$  between  $x = 10$  and  $x = 11$
- h)  $y = -2x + 30$  between  $x = 11$  and  $x = 15$
- i)  $y = 23$  between  $x = 7$  and  $x = 9$
- j)  $y = 12$  between  $x = 6$  and  $x = 10$
- k)  $y = 10$  between  $x = 7.5$  and  $x = 8.5$
- l)  $y = 8$  between  $x = 5$  and  $x = 11$
- m)  $y = 4x - 20$  between  $x = 7$  and  $x = 7.5$
- n)  $y = -4x + 44$  between  $x = 8.5$  and  $x = 9$
- o)  $y = 4$  between  $x = 6$  and  $x = 10$
- p)  $y = 2x - 8$  between  $x = 4$  and  $x = 6$
- q)  $y = -2x + 24$  between  $x = 10$  and  $x = 12$

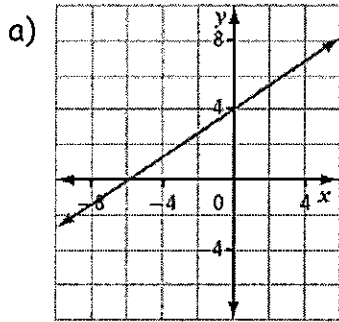




**M10-C Lin Eqs & Graphs Quick Check**  
**C1-C2 Linear Relations & Graphing Lines**

Name: \_\_\_\_\_

1. Determine the slope for each of the following. (MHR pg. 324-326)



Slope = \_\_\_\_\_

b) 

Time (s)	Distance (m)
1	4
2	7
3	10
4	13
5	16
6	19
7	22

Slope = \_\_\_\_\_

c) A line passing through the points (3,6) and (-3, -12).

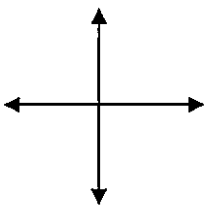
Slope = \_\_\_\_\_

d) In Manitoba, the number of people aged 12 and older who have asthma was 63 028 in 1996 and 73 427 in 2005. Round your answer to the nearest person.

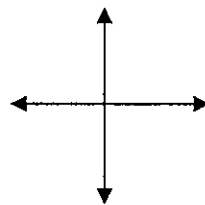
Slope = \_\_\_\_\_

2. Sketch a line with each of the given slopes.

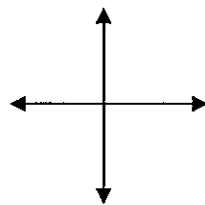
a) Positive Slope



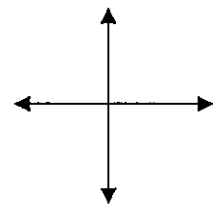
b) Negative Slope



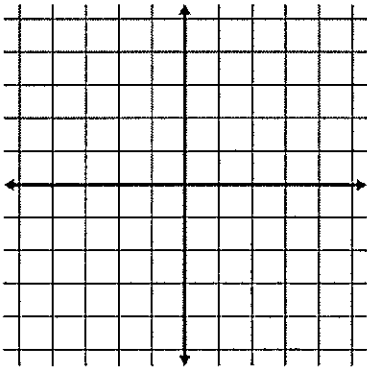
c) Slope is 0



d) Slope is Undefined



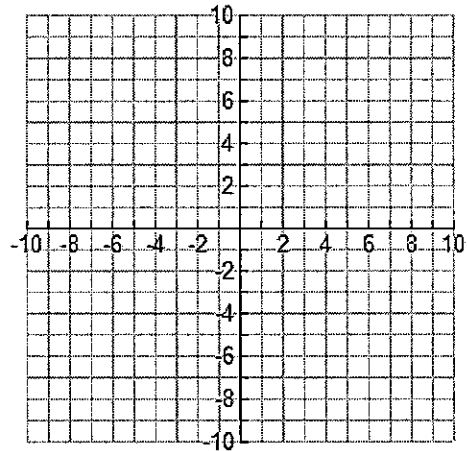
3. Complete the table below.

Equation: $y = \frac{1}{2}x + 2$	Table of Values	Graph
Domain: $\{x \mid -2 \leq x \leq 4, x \in R\}$		
Range:		
Linear or Non-Linear (Circle One)		
Slope: (If linear)		

4. The equation  $2x + 3y - 12 = 0$  defines a line.

(a) Determine the  $x$ -intercept of the line.

(c) Graph the line.

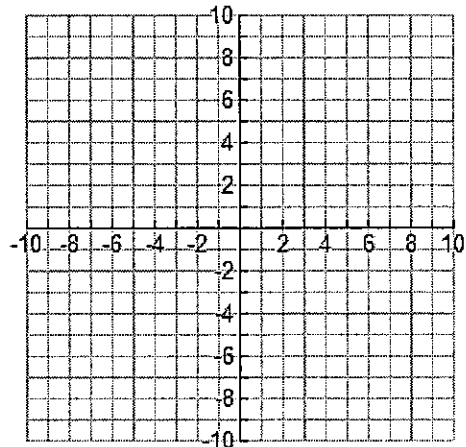


(b) Determine the  $y$ -intercept of the line.

5. The equation  $4x - 3y + 15 = 0$  defines a line.

a) Write the equation in slope-intercept form.

c) Graph the line.



b) State the slope and  $y$ -intercept of the line.

# Why Did Gyro Go Into a Bakery?



For each exercise below, find the equation of the line that has the given slope and passes through the given point. Circle the letter next to the correct equation. Then write this letter in each box at the bottom of the page that contains the number of that exercise.

① $m = 2; (3, 2)$	<input type="checkbox"/> G	$y = 2x + 1$	<input type="checkbox"/> R	$y = 2x - 4$
② $m = -3; (1, 4)$	<input type="checkbox"/> O	$y = -3x + 7$	<input type="checkbox"/> P	$y = -3x + 2$
③ $m = -5; (-1, 3)$	<input type="checkbox"/> M	$y = -5x - 2$	<input type="checkbox"/> D	$y = -5x + 6$
④ $m = 3; (-4, -7)$	<input type="checkbox"/> V	$y = 3x + 1$	<input type="checkbox"/> E	$y = 3x + 5$
⑤ $m = -1; (5, -2)$	<input type="checkbox"/> U	$y = -x + 3$	<input type="checkbox"/> C	$y = -x - 1$
⑥ $m = \frac{1}{2}; (6, 1)$	<input type="checkbox"/> W	$y = \frac{1}{2}x - 5$	<input type="checkbox"/> H	$y = \frac{1}{2}x - 2$
⑦ $m = -\frac{2}{3}; (3, 4)$	<input type="checkbox"/> A	$y = -\frac{2}{3}x - 7$	<input type="checkbox"/> I	$y = -\frac{2}{3}x + 6$
⑧ $m = \frac{4}{3}; (-2, 0)$	<input type="checkbox"/> K	$y = \frac{4}{3}x + \frac{5}{2}$	<input type="checkbox"/> F	$y = \frac{4}{3}x + \frac{8}{3}$
⑨ $m = -\frac{1}{4}; (2, 1)$	<input type="checkbox"/> J	$y = -\frac{1}{4}x + \frac{3}{2}$	<input type="checkbox"/> D	$y = -\frac{1}{4}x - \frac{3}{8}$
⑩ $m = 4; (-1, \frac{1}{2})$	<input type="checkbox"/> A	$y = 4x - \frac{2}{3}$	<input type="checkbox"/> T	$y = 4x + \frac{9}{2}$
⑪ $m = -2; (0, 0)$	<input type="checkbox"/> L	$y = -2x$	<input type="checkbox"/> B	$y = -2x - 2$
⑫ $m = 0; (-5, \frac{3}{4})$	<input type="checkbox"/> S	$y = \frac{3}{4}$	<input type="checkbox"/> N	$y = -5x$



9	5	12	10	8	2	1	10	6	4	12	3	4	11	11	2	8	7	10
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OBJECTIVE 5-n: To find an equation of a line given the slope and one point on the line.

# What Happened When Two Fruit Companies Merged?

For each exercise below, find the equation of the line passing through the given points. Circle the two letters next to the correct equation. Then write these letters in the two boxes at the bottom of the page that contain the number of that exercise.

Answers:

① (1, 5) (2, 7)

IS  $y = \frac{2}{3}x + 3$

TH  $y = \frac{1}{2}x - 4$

② (0, 1) (3, -8)

AP  $y = -\frac{3}{2}x + 8$

UI  $y = -3x + 5$

③ (2, -3) (4, -2)

ST  $y = \frac{1}{2}x - 7$

DE  $y = 2x + 3$

④ (2, 5) (4, 2)

CT  $y = -3x + 1$

EY  $y = 4x + 7$

⑤ (-3, -5) (-1, 3)

LO  $y = -\frac{3}{2}x - 4$

IL  $y = 2x + 1$

Answers:

⑥ (3, -1) (-6, -4)

HA  $y = \frac{1}{2}x - 1$

ER  $y = -\frac{3}{4}x + 4$

⑦ (4, 1) (-4, 7)

IS  $y = \frac{1}{3}x + \frac{8}{3}$

EL  $y = -2x - 1$

⑧ (-1, 2) (3, 4)

PE  $y = -x + 2$

EA  $y = -\frac{3}{4}x + 2$

⑨ (-1, -4) (2, 0)

SO  $y = \frac{4}{3}x - 2$

AR  $y = \frac{1}{3}x - 2$

⑩ (3, -1) (-3, 5)

MA  $y = \frac{1}{2}x + \frac{5}{2}$

FE  $y = \frac{4}{3}x - \frac{8}{3}$

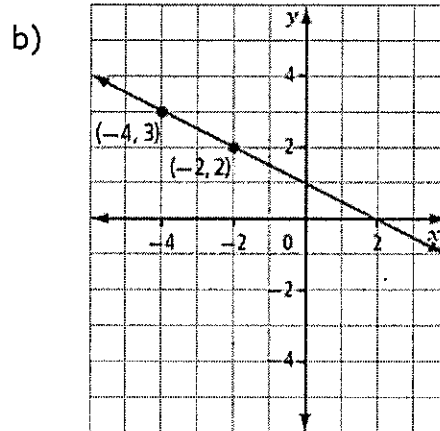
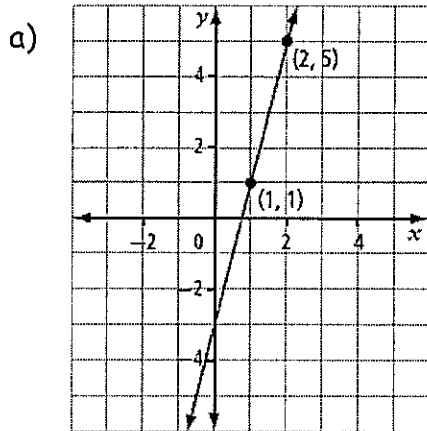
3	3	5	5	8	8	1	1	4	4	7	7	9	9	2	2	10	10	6	6
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M10-C Linear Equations & Graphs  
C3 - Determine Equations Assignment

Name: \_\_\_\_\_

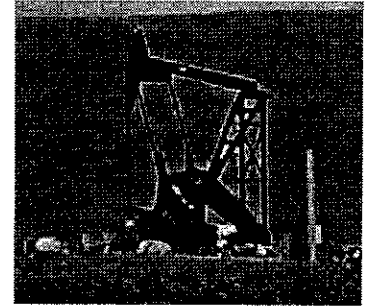
Complete the following on a separate sheet of paper.

1. Determine the equation of each line below in slope-intercept form ( $y = mx + b$ ) and general form ( $Ax + By + C = 0$ )

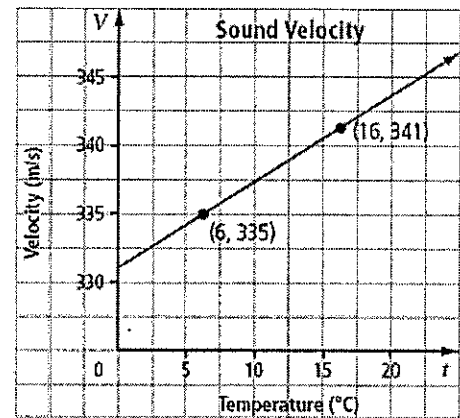


- c) A line that passes through the points (5, 1) and (3, -7).
- d) A line that passes through the points (5, -8) and (1, 4).
- e) A line with a slope of 3 and x-intercept of 4.
- f) A line that has the same slope as  $3x + y = 5$  and passes through (-2, 4).
- g) A line that has a slope of 0 and passes through (4, -5).
- h) A line that has x-intercept of 2 and y-intercept of -6.
- i) A line that has the same slope as the line  $x - 2y + 6 = 0$  and the same x-intercept as the line  $3x - 2y = 24$ .

2. An "iron horse" pumpjack starts to pump crude oil into a tank at a constant rate of  $1.2 \text{ m}^3/\text{h}$ . After 24 h, the tank contains  $29 \text{ m}^3$  of oil.
- Write an equation that describes the volume,  $V$ , in cubic metres, of oil in the tank after  $t$  hours.
  - The tank can hold a maximum of  $155 \text{ m}^3$  of oil. How long will it take to fill the tank?
  - Was the tank empty before it started filling? Explain.



3. The graph shows the linear relationship between the velocity of sound,  $V$ , in metres per second, and the temperature,  $t$ , in degrees Celsius, of dry air. At  $6^\circ\text{C}$ , the velocity of sound is  $335 \text{ m/s}$ . At  $16^\circ\text{C}$ , it is  $341 \text{ m/s}$ .



- What is the slope of the line?
  - What rate of change does the slope represent?
  - What is the equation of the line?
  - Determine the velocity of sound at  $35^\circ\text{C}$ .
  - What is the air temperature when the velocity of sound is  $348 \text{ m/s}$ ?
4. Suppose Canada's population has grown steadily since 2000. In 2001, the population was 30.0 million. In 2009, it was 33.7 million.
- Let  $t$  represent the number of years since 2000. Let  $p$  represent the population of Canada in millions. Write the coordinates of two points in the form  $(t, p)$ .
  - Determine the slope of the line through the points.
  - What rate does the slope represent?
  - Write an equation to represent population growth in Canada since 2000.
  - Predict Canada's population in 2017.

## Slopes of Parallel and Perpendicular Line Segments

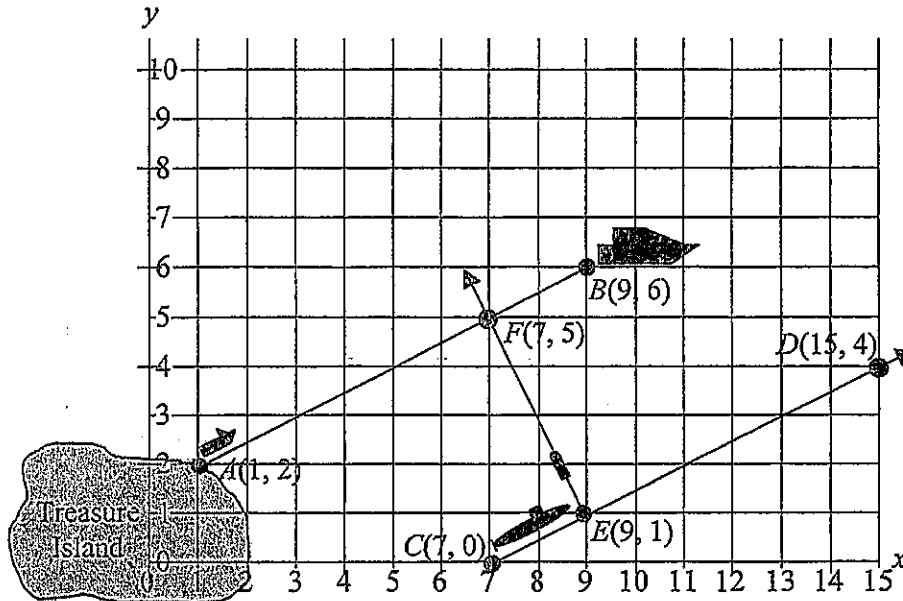
4.4 Solve problems using slopes of parallel lines and perpendicular lines. [CN, PS, V]

### Investigation

To complete this investigation you will need to recall two definitions from plane geometry.

- *Parallel lines* are lines that do not intersect.
- *Perpendicular lines* are lines that intersect at right angles.

The pirate Bartholomew Robert was rumored to have hid a treasure of gold coins on a small island. You are part of a Discovery Channel expedition that found the treasure and is transporting it from the island to an awaiting ship. A grid of the area around the island is shown below. The scales on the axes are in kilometres.



Your motor boat is leaving the island at point  $A(1, 2)$  and traveling to point  $B(9, 6)$  to rendezvous with the ship. Unbeknownst to you, a submerged submarine has approached your boat and is now traveling at the same speed as you. The path of the submarine follows a line from point  $C(7, 0)$  to  $D(15, 4)$ .

1. a) How is the path of the submarine related to the path of your boat?  
  
b) Calculate the slope of your boat's path.  
  
c) Calculate the slope of the submarine's path.  
  
d) How are the slopes of the paths of the two vessels related?



2. The submarine fires a torpedo from point  $E(9, 1)$  and it hits your boat when your boat is at point  $F(7, 5)$ .
- How is the path of the torpedo related to the path of your boat?
  - Calculate the slope of the torpedo's path.
  - How is the slope of the torpedo's path related to the slope of your boat's path?
  - This is the final chapter in the story of the treasure hunt. From a literary perspective, how should the story end?

### Tutorial

Complete the following statements by filling in the blanks.

- Parallel lines do not \_\_\_\_\_ and perpendicular lines meet at \_\_\_\_\_ angles.
- The slopes of parallel lines are \_\_\_\_\_.
- If two lines are perpendicular then their slopes are *negative reciprocals* of each other. That is, the slopes of two lines have \_\_\_\_\_ signs and are \_\_\_\_\_ of each other.

### Examples

Example 1: *Slopes of Parallel and Perpendicular Lines*

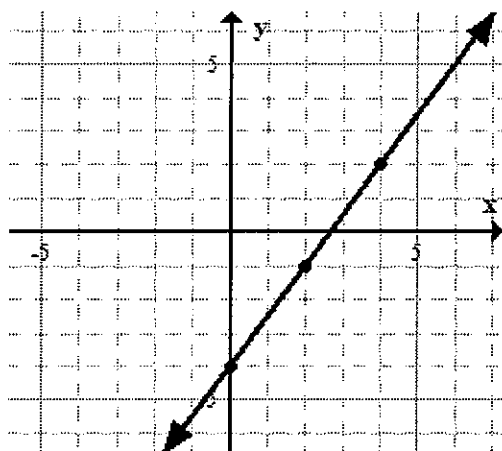
Determine the slope of a line segment parallel and perpendicular to a segment with each given slope.

Given Slope	Slope of Parallel Lines	Slope of Perpendicular Lines
$\frac{3}{5}$		
7		
$-\frac{4}{3}$		
-0.5		
undefined		

**Math 10-C Linear Equations & Graphs Quick Check**  
**C3-C4 Determine Equations & Parallel/Perpendicular Lines**

Name: \_\_\_\_\_

1. The equation of the graph below in slope-intercept form is \_\_\_\_\_.



2. The equation of a line, with a slope of 3 and a y-intercept of -2, in slope-intercept form is \_\_\_\_\_.

3. A line has a slope of -2 and passes through the point (-8,21). Write the equation of the line in slope-intercept form. [1 mark]

4. A line passes through the points (-6,10) and (-2,0). Write the equation of the line in slope-intercept form. [2 marks]

5. Write each of the following linear equations in general form ( $Ax + By + C = 0$ ).

a)  $y = -6x + 7$

b)  $y = \frac{7}{3}x + 6$

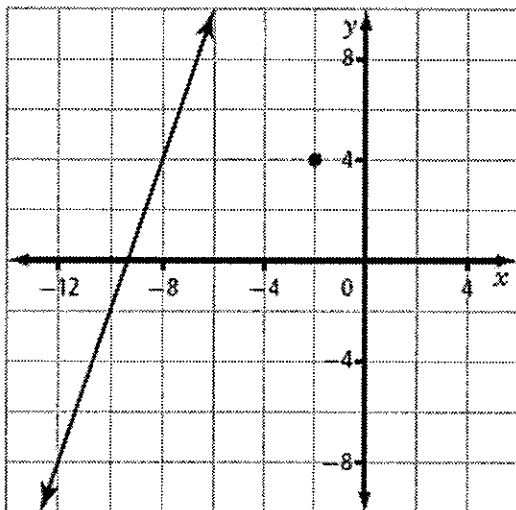
c)  $y = -\frac{4}{5}x + \frac{1}{2}$

6. The slope of a line is 3. The slope of a line that is parallel is \_\_\_\_\_.

7. The slope of a line is  $\frac{4}{5}$ . The slope of a line that is perpendicular is \_\_\_\_\_.

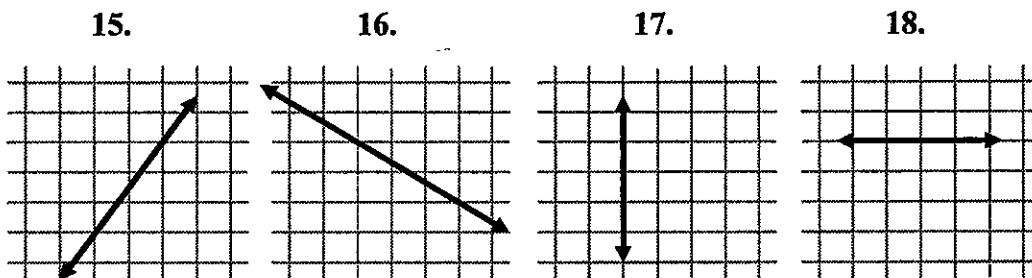
8. Write the slope-intercept form and general form for the equation of a line that is perpendicular to  $x + 6y - 12 = 0$  and passes through the point (2,4). [3 marks]

9. Write the slope-intercept form and general form for the equation of a line that is parallel to the given line and passes through the given point. [2 marks]



1. Given the line  $y = 5x - 5$ ; if  $x = 2$ , then  $y =$  \_\_\_\_\_
2. Given the line  $y = 4 - x$ ; if  $x = -2$ , then  $y =$  \_\_\_\_\_
3. Given the line  $4x - 2y + 6 = 0$  ; if  $x = 2$ , then  $y =$  \_\_\_\_\_
4. Given the line  $3x + 2y + 8 = 0$  ; if  $y = 2$ , then  $x =$  \_\_\_\_\_
5. Given the line  $y = 3x - 13$ ; if  $y = 2$ , then  $x =$  \_\_\_\_\_
6. Given the line  $y = 3x$  ; a point on the line is the point  $(2, y)$   $y =$  \_\_\_\_\_
7. Given the line  $y = 3x$  ; a point on the line is the point  $(x, 3)$   $x =$  \_\_\_\_\_
8. Given the line  $y = x + 1$ ; a point on the line is the point  $(7, y)$  **the point is** \_\_\_\_\_
9. Given the line  $x + 2y - 29 = 0$ ; a point on the line is  $(x, 10)$  **the point is** \_\_\_\_\_
10. What is the slope formula? \_\_\_\_\_
11. Find the slope of the line through  $(1, 2)$  and  $(3, 6)$  \_\_\_\_\_
12. Find the slope of the line through  $(1, 2)$  and  $(6, 12)$  \_\_\_\_\_
13. Find the slope of the line through  $(-1, 2)$  and  $(6, -12)$  \_\_\_\_\_
14. Find the slope of the line through  $(-1, -2)$  and  $(-6, 12)$  \_\_\_\_\_

Find the slope of the line



19. What is the equation of a line in slope intercept form? \_\_\_\_\_
20. What is the equation of  $4x - y + 6 = 0$  in slope intercept form? \_\_\_\_\_
21. What is the equation of  $4x + y + 6 = 0$  in slope intercept form? \_\_\_\_\_
22. What is the equation of  $4x - 2y + 6 = 0$  in slope intercept form? \_\_\_\_\_
23. What is the equation of  $4x + 3y + 6 = 0$  in slope intercept form? \_\_\_\_\_
24. What is the slope of the line  $y = 3x + 7$  ? \_\_\_\_\_
25. What is the slope of the line  $y = 4 - 9x$  ? \_\_\_\_\_
26. What is the slope of the line  $12x + 3y + 6 = 0$  ? \_\_\_\_\_
27. What is the slope of the line  $10x - 2y + 6 = 0$  ? \_\_\_\_\_
28. Given the line  $y = 3x + 1$ ; what is the y-intercept? \_\_\_\_\_
29. Given the line  $y = 9 - 8x$ ; what is the y-intercept? \_\_\_\_\_
30. Given the line  $13x - 2y + 8 = 0$  ; what is the y-intercept? \_\_\_\_\_
31. Given the line  $13x + 7y + 14 = 0$  ; what is the y-intercept? \_\_\_\_\_

**Standard form for the equation of a line  $Ax + By + C = 0$**

**Where A, B, and C are integers and A is positive.**

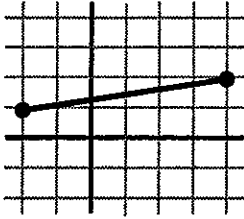
32. What is the equation of  $y = 3x + 1$  in standard form? \_\_\_\_\_
33. What is the equation of  $y = -3x - 2$  in standard form? \_\_\_\_\_
34. What is the equation of  $y = \frac{3}{2}x - 2$  in standard form? \_\_\_\_\_
35. What is the equation of  $y = \frac{-4}{3}x + 2$  in standard form? \_\_\_\_\_

**The x-intercept of a line occurs when  $y = 0$**

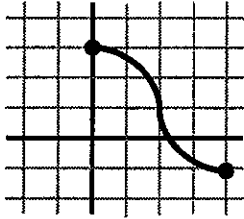
36. Given the line  $16x - 2y + 8 = 0$  ; what is the x-intercept? \_\_\_\_\_
37. Given the line  $6x - 2y + 12 = 0$  ; what is the x-intercept? \_\_\_\_\_
38. Given the line of  $y = -3x - 6$ ; what is the x-intercept? \_\_\_\_\_
39. Given the line of  $y = 2x - 3$ ; what is the x-intercept? \_\_\_\_\_
40. Given the function  $f(x) = 5x - 3$  ; find  $f(2)$  \_\_\_\_\_
41. Given the function  $f(x) = 6 - 4x$  ; find  $f(2)$  \_\_\_\_\_
42. Given the function  $f(x) = \frac{3}{2}x - 1$  ; find  $f(6)$  \_\_\_\_\_
43. Given the function  $f(x) = \frac{-4}{3}x + 2$  ; find  $f(6)$  \_\_\_\_\_
44. Given the function  $f(x) = x + 2$  ; find  $x$  if  $f(x) = 11$  \_\_\_\_\_
45. Given the function  $f(x) = 4x - 2$  ; find  $x$  if  $f(x) = 10$  \_\_\_\_\_
46. Given the function  $f(x) = 7 - x$  ; find  $x$  if  $f(x) = 9$  \_\_\_\_\_
47. Given the function  $f(x) = \frac{3}{2}x + 2$  ; find  $x$  if  $f(x) = 8$  \_\_\_\_\_
48. Given  $f(4) = 5$ ; the coordinates of the point on the function  $y = f(x)$  are \_\_\_\_\_
49. Given  $f(-1) = 2$ ; the coordinates of the point on the function  $y = f(x)$  are \_\_\_\_\_
50. Given the function  $f(x) = x^2 - 3$  ; find  $f(-1)$  \_\_\_\_\_
51. Given the function  $f(x) = \sqrt{x - 6}$  ; find  $f(2)$  \_\_\_\_\_
52. Given the function  $f(x) = \sqrt{x + 10}$  ; find  $f(-2)$  \_\_\_\_\_

Find the domain

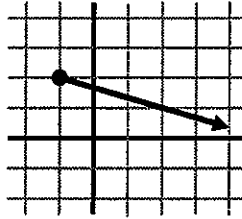
53.



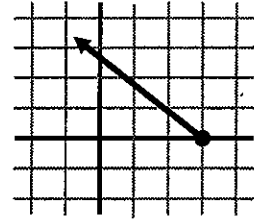
54.



55.

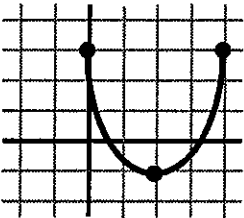


56.

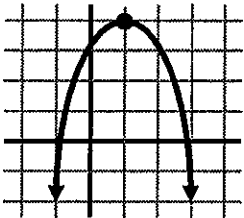


Find the range

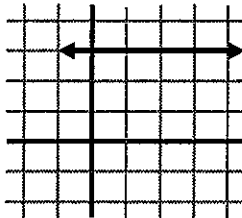
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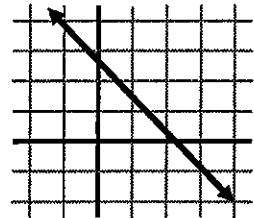
58.



59.



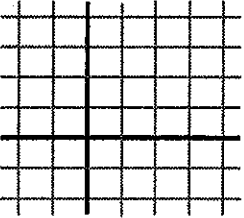
60.



Sketch using the slope and y-intercept. Label both.

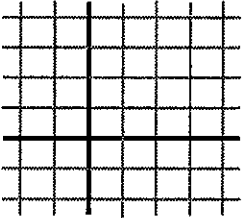
61.

$$y = 3x - 2$$



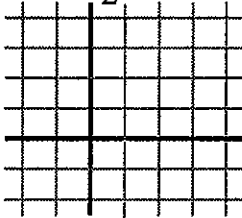
62.

$$y = -2x + 3$$



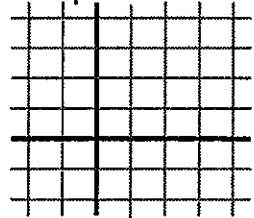
63.

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



64.

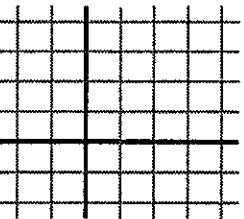
$$y = \frac{1}{4}x - 1$$



Sketch the following.

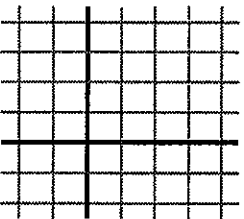
65.

$$y = 3$$



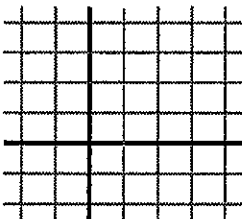
66.

$$x - 3 = 0$$



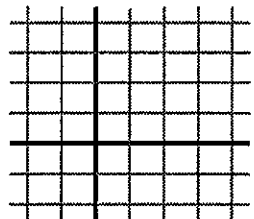
67.

$$2x - y - 2 = 0$$



68.

$$y = x$$



Find the **equation of the line** in slope-intercept form.

69. slope = 2 and y-intercept = 3

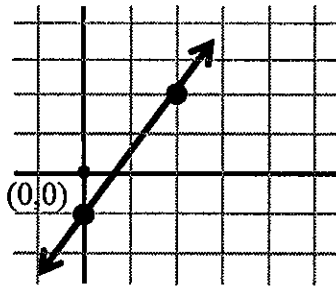
70. slope = 4 and y-intercept = -5

71. slope of 6 and the point (7, 8)

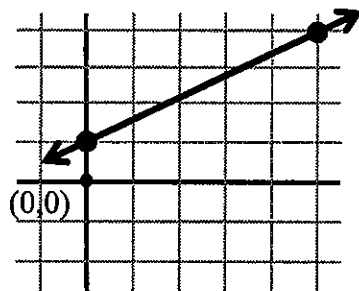
72. slope of  $\frac{1}{2}$  and the point (3, -4)

73. through the points (5, 6) and (7, 8)  $slope = \frac{(y_2 - y_1)}{(x_2 - x_1)}$

74.



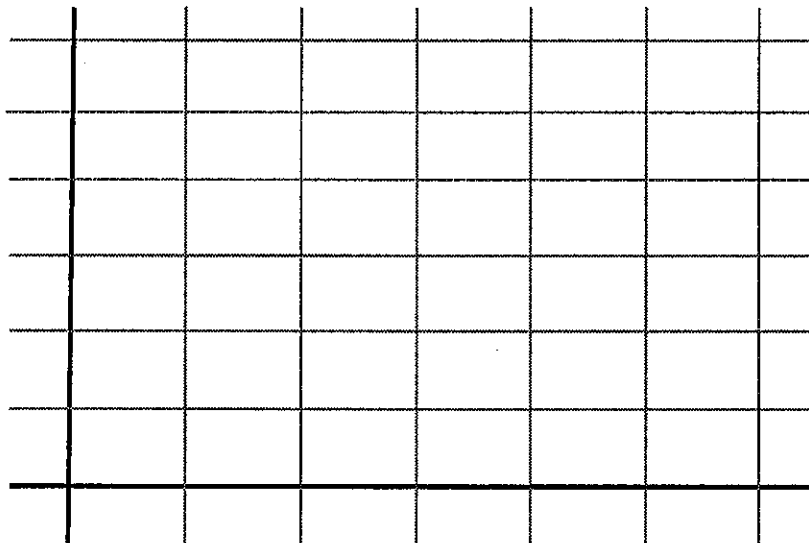
75.





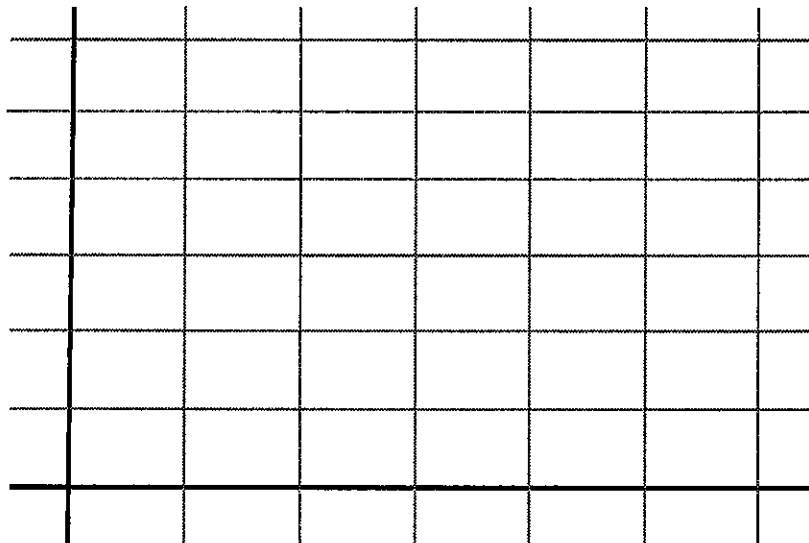
**You are renting a hall for your wedding reception.  
The hall costs \$1200 plus \$25 per guest (they are serving a meal)  
The hall has a maximum capacity of 300 people.**

76. What is the independent variable?
77. What is the dependent variable?
78. What is the domain?
79. What is the range?
80. Is the data discrete or continuous?
81. Give an **equation** relating the cost of the hall to the number of guests.
82. Sketch a graph based on your equation (number of guests on the horizontal axis).



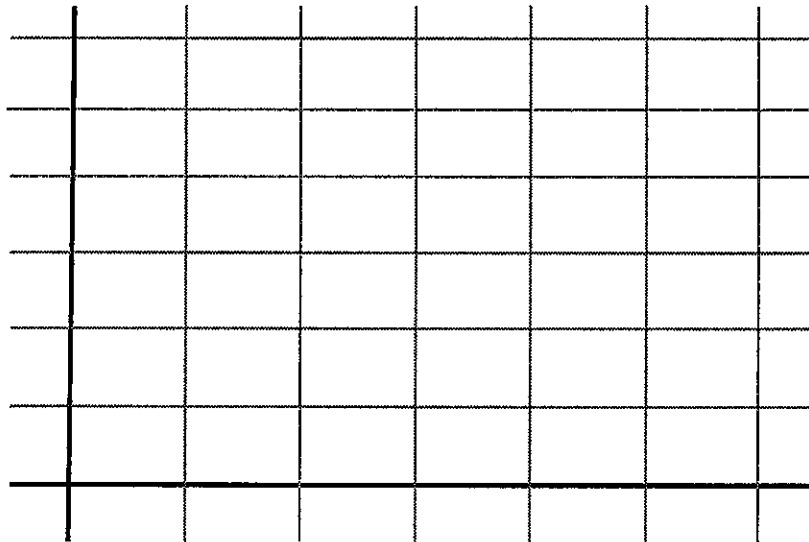
**You are an expert paper airplane maker and are selling paper airplanes. You currently have six paper airplanes constructed and ready for sale. Your price of construction is \$1.00 each. Your selling price is \$3.00 each.**

83. What is the independent variable?
84. What is the dependent variable?
85. What is the domain?
86. What is the range?
87. Is the data discrete or continuous?
88. Give equations relating the Price (of construction AND of selling) to the number of planes.
89. Sketch a graph based on your equation (number of planes on the horizontal axis).

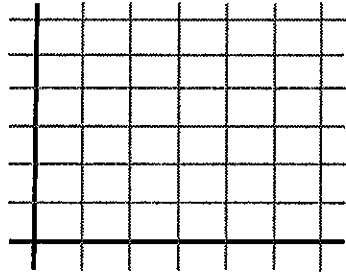


A cell phone rate plan charges \$35.00 for the first 100 minutes. The next 300 minutes are charged at a rate of \$0.10 per minute. Any number of minutes over the 400 minutes are charged at a rate of \$0.05 per minute.

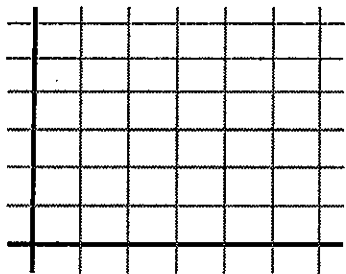
90. What is the independent variable?
91. What is the dependent variable?
92. What is the domain?
93. What is the range?
94. Is the data discrete or continuous?
95. Give **equations** relating the cost to the number of minutes.
96. Sketch a graph based on your equation (number of minutes on the horizontal axis).



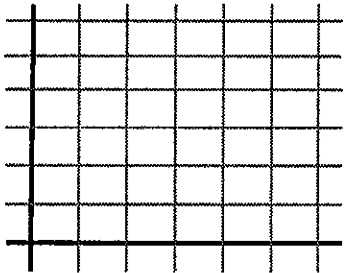
97. Sketch the line  $y = x + 1$  in the domain  $x > 1$



98. Sketch the line  $y = x + 1$  in the domain  $(1, 5]$



99. Sketch the line  $y = -x + 5$  in the domain  $[0, \infty)$



100. Sketch the line  $y = -\frac{2}{5}x + 6$  in the domain  $0 \leq x \leq 5$

