

Math 8

Module 3 Blackline Masters

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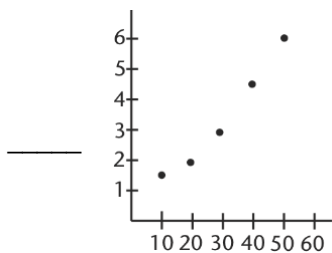
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Lesson 3.1A

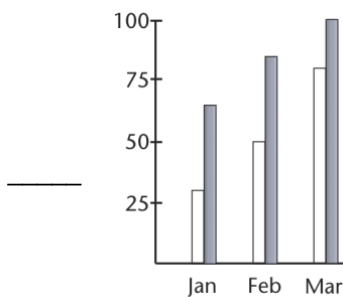
Warm-up

1. Match each data set with its graph.



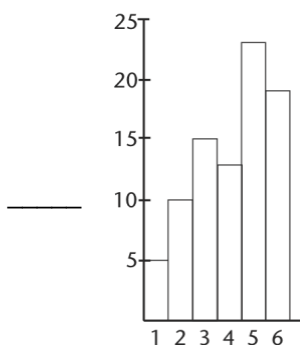
a.

(1, 5)
(2, 10)
(3, 15)
(4, 13)
(5, 23)
(6, 19)



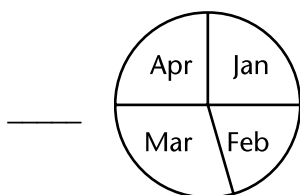
b.

Jan	3
Feb	2
Mar	4
Apr	3



c.

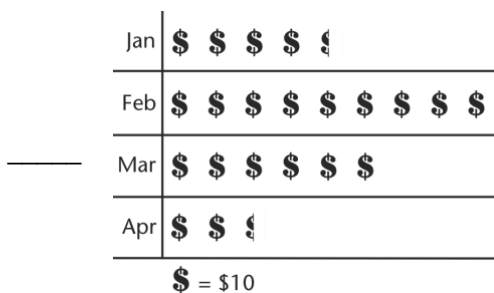
Jan	45
Feb	90
Mar	60
Apr	25



d.

Jan	30
Feb	50
Mar	80

Jan	65
Feb	85
Mar	100



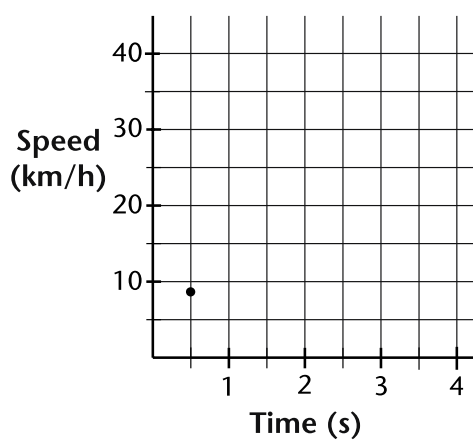
e.

(10, 1.5)
(20, 2)
(30, 3)
(40, 4.5)
(50, 6)

2. Finish drawing the following graphs.

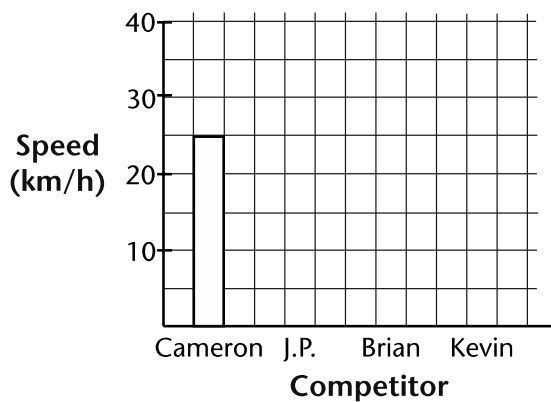
a. Speed of a race car after the starting gun.

Time (s)	Speed (km/h)
0.5	8
1.0	21
2.5	32



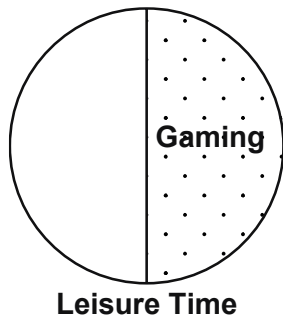
Remember to join the points with straight lines once you have them all plotted.

b.



Cameron	25
J.P.	38
Brian	14
Kevin	32

c.



Gaming	50%
Reading Books	25%
Listening to Music	25%

d.

Favourite Snacks

Chocolate Bars	
Chips	
Gum	

Key  = 5 people

Chocolate bars	20
Chips	30
Gum	15

Lesson 3.1A Try It!
Activity 3

Look back through the lesson, and use this table to summarize the strengths and limitations of each graph type. Choose from the descriptions that follow the table. Descriptions can be used more than once. Add descriptions of your own if you have any that aren't included in the list.

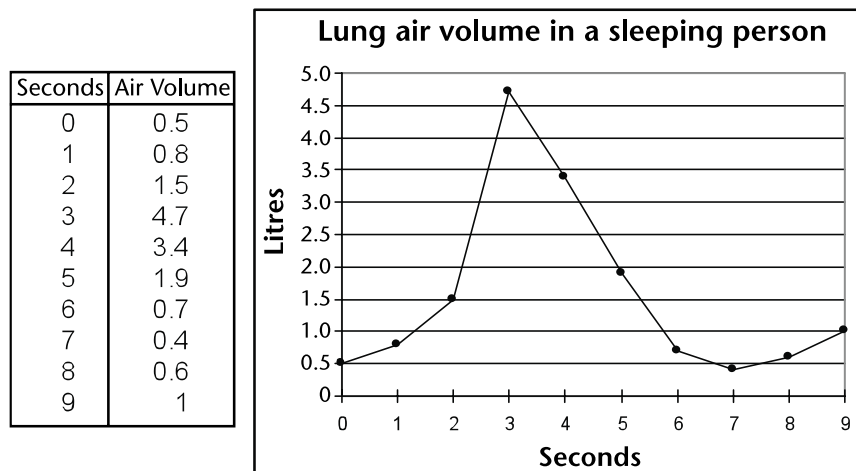
Graph Type	Strengths	Limitations
bar graph		
circle graph		
line graph		
pictograph		

Possible Descriptions

- used to compare parts to the total
- partial icons make calculating difficult
- can compare two sets of discrete data
- more difficult to compare one category to another
- shows data that changes over time
- shouldn't be used for discrete data
- can be used for discrete data
- interesting to look at
- can be difficult to draw: requires a protractor
- must use a key to calculate
- provides approximate numbers using scale on left side
- can only use with discrete data
- used to compare two sets of numbers

Lesson 3.1B Try It!
Activity 2

Here's a set of data that shows a comparison between time and the litres of air in a sleeping person's lungs.



1. Answer the following questions about the graph.

a. Describe what happens to air volume.

b. How long does it take to fill the lungs?

c. How long does it take to empty the lungs?

2. We assume the person keeps breathing. Approximate the time the lungs will be full again.

3. How long is the cycle of breathing for this person?

4. Estimate from the graph the air volume at:

2.5 seconds _____

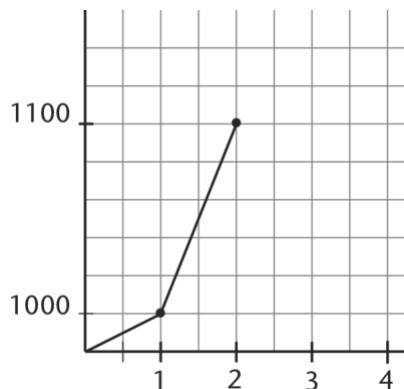
7.5 seconds _____

15 seconds _____

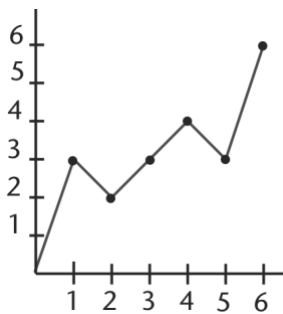
Section Assignment 3.1 Part 1: Analysis

1. Observe the three graphs. Label anything about the graphs that makes them misleading. If a graph has no misleading features, put a check mark beside it. (4 marks)

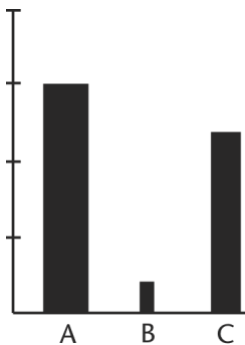
a.



b.



c.



2. Choose one graph type, and list two advantages it has over other graph types. (2 marks)

3. Blood pressure is one way to measure how hard a person’s heart is working. It goes up and down depending on the person’s age, activity level, stress, food intake, medicines, disease, and other factors.

What type of graph would best be used to track someone’s blood pressure during a day?
(1 mark)

Give a reason for your answer. (1 mark)

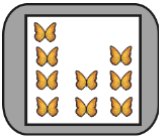
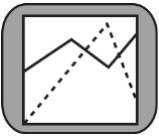
4. Find an example of a situation that would be graphed with each of the other graph types. (Don’t use your answer to #3 above). (4 marks)

Give two reasons for using each graph. (8 marks)

Type of Graph	Example	Two Reasons
1. bar graph		1.
		2.
2. line graph		1.
		2.
3. double bar graph		1.
		2.
4. circle graph		1.
		2.

5. Give three reasons why someone might want to use a graph to present—or misrepresent—some data. (3 marks)

6. Choose one item from Column A and one item from Column B to label each situation with the most appropriate word and graph type. Use each item only once. (8 marks)

Column A	Column B			
A. continuous	1		3.	
B. discrete				
C. parts of a total	2		4.	
D. misleading				

- a. Mina wants to graph the number of doughnuts sold in her kiosk each day. There are 6 different varieties of doughnuts for sale.
- b. Alan reads a bar graph made by his employee Jaheem that shows Jaheem did more work than all others. The bars are all close in height, and Jaheem’s bar is at the end, separated from the other bars by some blank space.
- c. Moira’s job involves testing the temperature of restaurant ovens. She uses a special thermometer, and leaves it in each oven for at least an hour. She records the temperature of each oven several times during the hour.
- d. Jocelyn lists the number of students in each grade of her school. She wants to create a graph to show these numbers easily.

Column A	Column B

Section Assignment 3.1 Part 2:
Misrepresentation

7. You are trying to misrepresent how much work you did, and mislead others into thinking that you did more. Sketch three graphs (bar graph, pictograph and circle graph) that each try to mislead. (19 marks)

Include a title for all graphs. (3 marks)

Use a ruler for all straight lines. (1 mark)

Use a compass or trace around a circular object for the circle graph. (1 mark)

For the bar graph, label the axes (horizontal and vertical). (4 marks)

For the pictograph, include the key (4 marks).

For the circle graph, label each section, and include the percentage. (5 marks)

Evaluation Guidelines	Marks
Part 1: Analysis	/31
Part 2: Misrepresentation	/19
Total Marks	/50

Activity 1

- a. $y = x - 5$

$$y = -8$$

$$x = 7$$

b. $y = -3x + 2$

$$x = 0$$

$$x = 3$$

1

Lesson 3.2B

Warm-up

1.
 - a. Amrit sells her monster cookies for \$1.50 each. How much money will she make selling 35?

 - b. How many cookies will she need to sell to earn \$150?

2. Rowan helps at a vegetable stand at a farmers' market on Saturday mornings. He earns \$8 for helping set up the stand, and \$0.50 for each kilogram of vegetables that he sells. Calculate how much he earns for the morning if he sells:
 - a. 35 kg

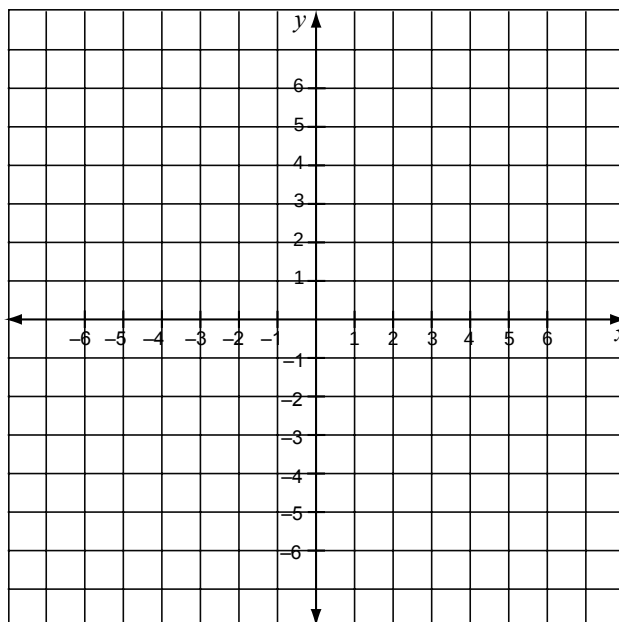
 - b. 50 kg

Lesson 3.2B Try It! Activity 2

- For the following linear equations, fill in the table of values using the given x-values. Then plot the graph.

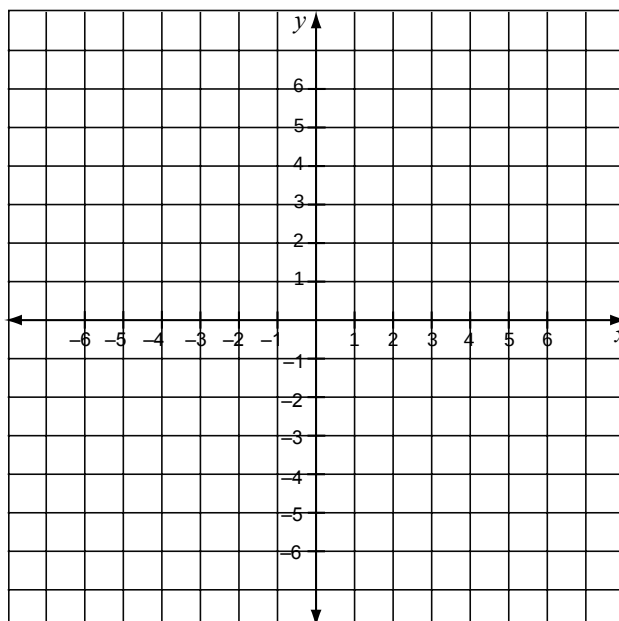
a. $y = x - 2$

x	y
-2	
0	
3	
6	



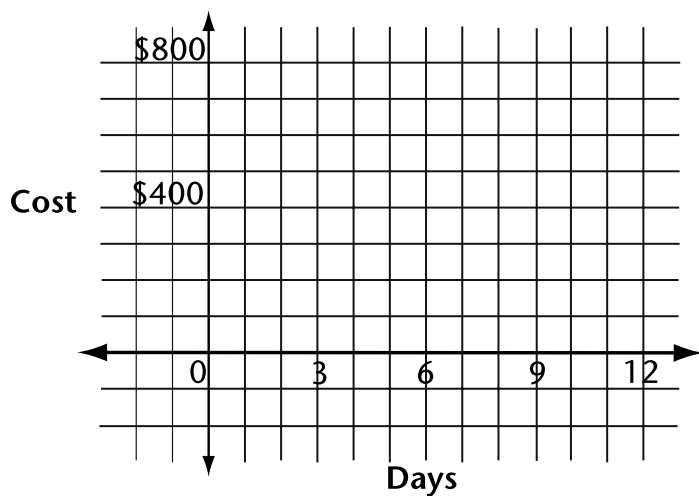
b. $y = -x$

x	y
-4	
-1	
2	
5	



2. Katie is getting a “value pass” for a local ski resort. She’ll pay \$250 plus \$30 per day of skiing. Fill in the table to show her skiing costs based on how many days she skis. Show the cost for 6 days, 10 days, and two more numbers of your choice. Then plot the graph of the costs.

Days						6	10		
Cost									



Lesson 3.2C Try It!
Activity 1

Look at the following tables of values. Describe the relationships between the variables.

1.

x	y
2	-2
8	4
10	6
12	8

Relationship: _____

2.

Number of Snacks Consumed at Dance	0	1	3	5
Cost to Attend Dance	\$5	\$6	\$8	\$10

Relationship: _____

3.

r	t
-3	9
-1	3
0	0
4	-12

Relationship: _____

Section Assignment 3.2 Part 1:
Theory

1. Define "Ordered Pairs." What is another term that means the same thing? (2 marks)

2. What type of equation forms a straight line when graphed? Give two examples.
(2 marks)

3. For the equation $y = 3x + 7$, identify the terms, variables, coefficients, and the constant.
(4 marks)

terms: _____

variables: _____

coefficients: _____

constant: _____

4. If an equation is satisfied by the ordered pair (0,0), what is the constant term? (1 mark)

Section Assignment 3.2 Part 2:
Tables of Values

5. Finish the table of values for each equation: (13 marks: 1 marks each)

a. $y = -4x$

x	y
-2	8
0	
1	
2	
4	

b. $d = 2c + 7$

x	y
-3	1
-2	
0	
1	
3	

c. $q = \frac{1}{2}p + 2$

p	q
-6	
-2	
0	
1	
4	

Section Assignment 3.2 Part 3:
Finding Relationships

6. For the following table of values, state the relationship between the two variables.
(8 marks)

a.

x	y
-4	0
-2	1
0	2
2	3

b.

s	t
16	32
8	16
4	8
2	4

c.

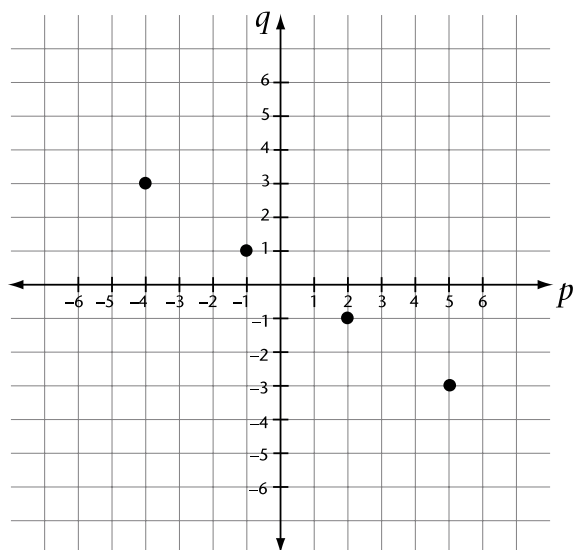
h	w
-3	-2
-1	0
1	2
3	4

d.

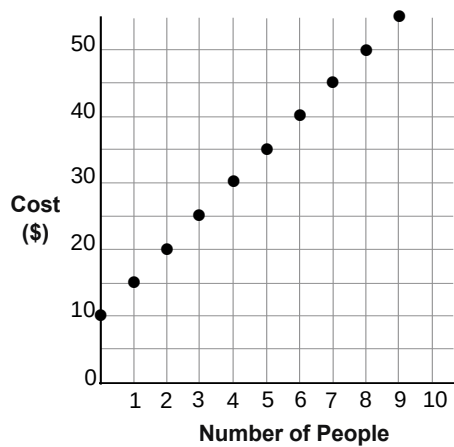
x	y
8	4
0	0
10	5
12	6

7. For the following graphs, describe the relationship between the two variables.
(4 marks)

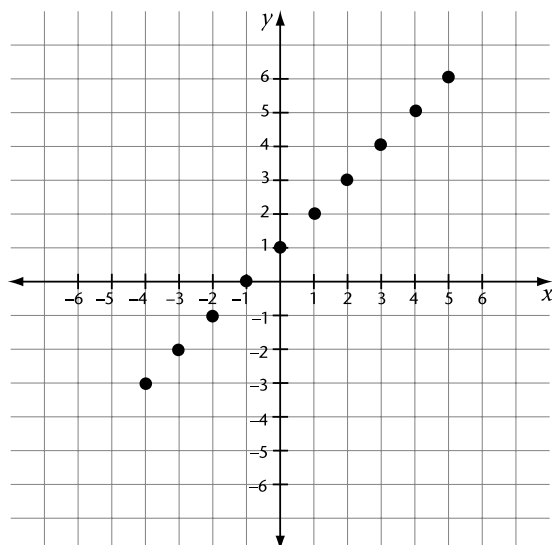
a.



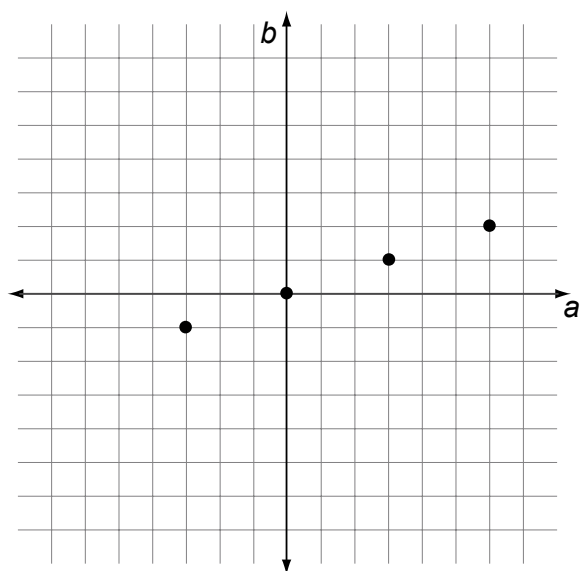
b.



c.



d.

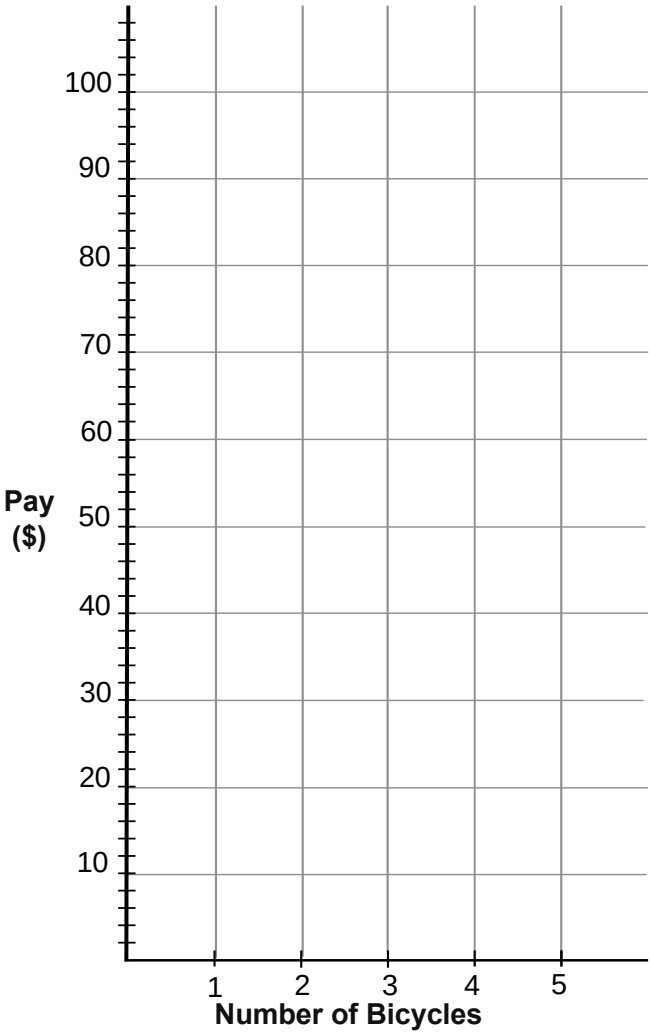


Section Assignment 3.2 Part 4:
Graphing

8. Manjeet gets paid \$23.00 for each bicycle she assembles.
- a. Fill in the table of values to show her pay compared to the number of bicycles she assembles. Use the values of 0, 1, 2, and 4 bicycles. (4 marks)

Bicycles				
Pay				

- b. Plot the points from the table of values on to the graph. (4 marks)

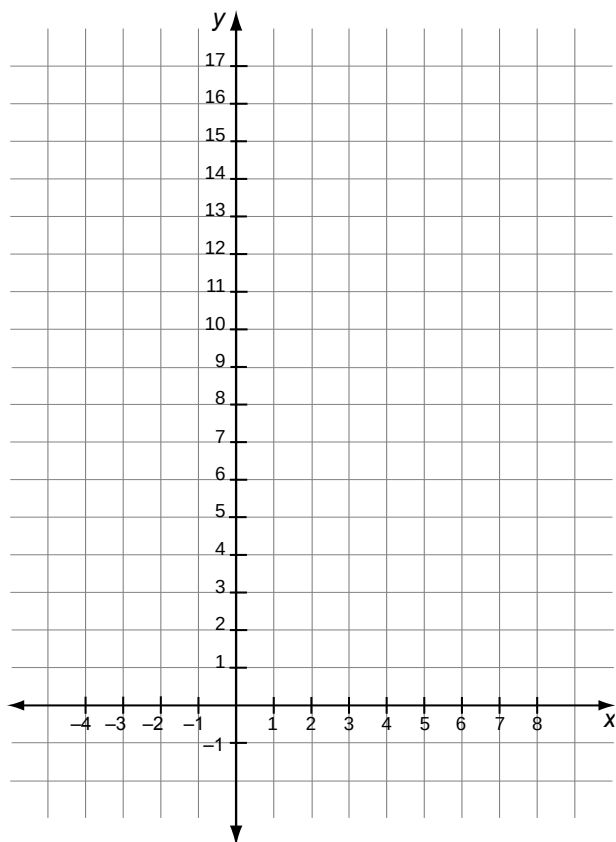


9. For the equation $y = 2x + 3$:

a. Fill in the missing numbers in the table of values. (4 marks)

x	y
-2	-1
0	
2	
3	
7	

b. Plot the graph using at least four points from the table of values that you created. (4 marks)



c. Check with a ruler or straightedge to make sure that all of the points fall on a line.

Put a check mark in the blank after you have finished checking: _____

Evaluation Guidelines	Marks
Part 1: Theory	/9
Part 2: Tables of Values	/13
Part 3: Finding Relationships	/12
Part 4: Graphing	/16
Total Marks	/50

Lesson 3.3A Try It!
Activity 2

For this Activity you will need:

- equation sheet
- algebra tiles

Use your equation sheet to model and solve the following equations. The first one has been set up for you.

1.

$$-3x - 5 = 10$$

2.

$$-2x - 3 = -7$$

3.

$$-5x - 1 = 9$$

4.

$$x + 7 = -5$$

5.

$$7 + 3x = -2$$

--	--

6.

$$-5 = -2x + 3$$

--	--

Lesson 3.3B
Warm-up

1. 4 times q is 12.
 - a. Write this in mathematical symbols.
 - b. What is q ?
 - c. What did you do to 4 and 12 to calculate q ?
2. 15 divided by p is 3.
 - a. Write this in mathematical symbols.
 - b. What is p ?
 - c. What did you do to 15 and 3 to calculate p ?
3. x is divided by 3 and the answer is 7.
 - a. Write this in mathematical symbols.
 - b. What is x ?
 - c. How can you rearrange 7 and 3 to equal x ?

Lesson 3.3B Try It!
Activity 1

1. For the expression or equations in the following table, answer the following questions:

- What is happening to x ?
- What's the opposite action?

The first one is done for you.

Expression or Equation	What's happening to x ?	What's the opposite?
$3x$	multiplied by 3	divided by 3
$x - 5$		
$\frac{x}{7}$		
$-2x$		
$14 + x$		
$-5x = 10$		
$\frac{x}{-4} = 8$		

2. Perform the “undoing” actions to each side of the equations to solve them:

a. $3x = 21$

b. $x + 16 = 8$

c. $x - 9 = 8$

3. Solve. Be careful with the negative numbers.

a. $\frac{x}{8} = 2$

b. $5x = -35$

c. $x - 16 = -3$

Lesson 3.3B Try It!
Activity 3

Answers are provided for each of the equations below. Some are correct, and some are not. Start by providing a check for each equation. If the provided answer is correct, place a check mark beside the equation. If the answer is not correct, solve the equation for the correct answer.

1. $6m + 4 = 28$
 $m = 3$

Check:	LS	RS
	$6m + 4$	28

2. $-8 = -24 - 4x$
 $x = -4$

Check:	LS	RS
	-8	$-24 - 4x$

3. $-5 - 9s = 13$
 $s = -2$

Check:	LS	RS
	$-5 - 9s$	13

4. $7 = 4x - 13$
 $x = -5$

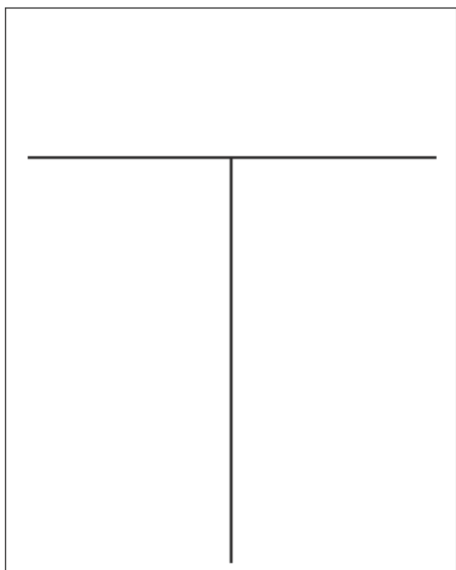
Check:

LS	RS
17	$4x - 13$

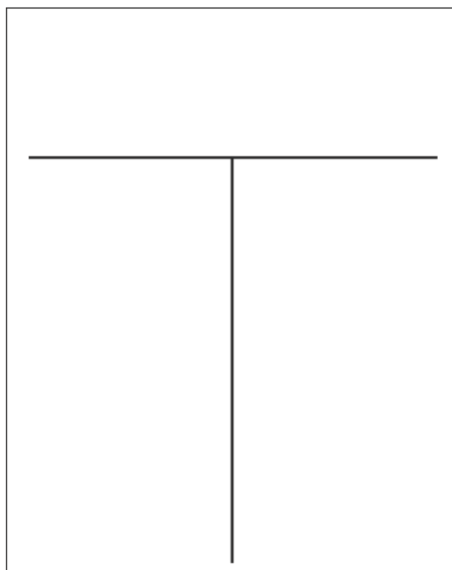
Section Assignment 3.3 Part 1:
Modeling with Algebra Tiles

1. Model these equations with algebra tiles. Sketch your arrangement on the equation sheets provided below. Don't forget to write in the equation! (6 marks)

a. $8x + 10 = -13$

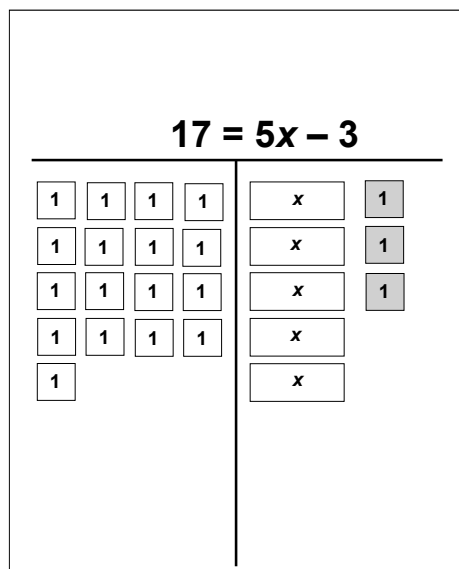


b. $17 = 5x - 3$



For each picture in questions 2–4, explain how you would solve the equation using algebra tiles. Then give the solution for each equation. (15 marks)

2.



3.

$x - 6 = 11$

x	1	1	1	1	1
	1	1	1	1	1
	1	1	1	1	
			1	1	
			1	1	
			1		

$10 = -4x - 2$

1 1 1 1 1 1 1 1 1 1	x 1 x 1 x x
---	---

Section Assignment 3.3 Part 2:
Solving Linear Equations Symbolically

5. Solve the following:

a. $2 = \frac{x}{9}$

b. $3x - 8 = 16$

c. $\frac{x}{7} + 8 = 10$

d. $3(x - 4) = 6$

6. Solve. Show a check of your answer. (9 marks)

a. $-8(x - 1) = 24$

b. $\frac{4x}{5} = 8$

c. $\frac{2x}{3} + 6 = 20$

7. Describe the steps to solve the following equations. (6 marks)

a. $5x - 2x + 3 = 12$

b. $7x + 9 - 2x + 4 = 33$

8. a. Manjeet has solved the equation $4x - 9 = 11$. Help her check her work by describing any errors she made. (4 marks)

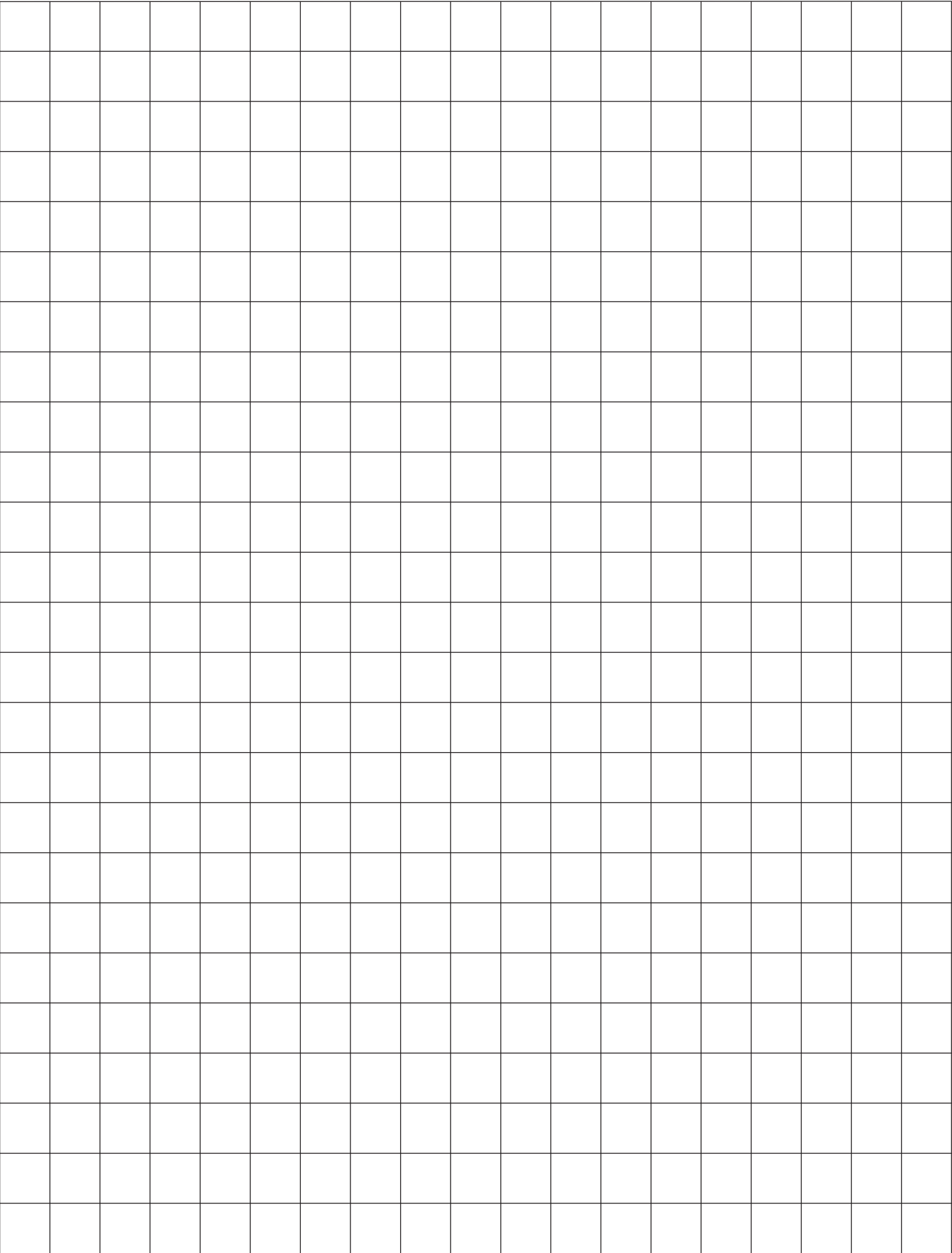
$$\begin{array}{r} 4x - 9 = 11 \\ +9 \quad +9 \end{array}$$

$$\begin{array}{r} 4x = 2 \\ \div 4 \quad \div 4 \end{array}$$

$$x = 8$$

- b. Show the correct solution to this question. (2 marks)

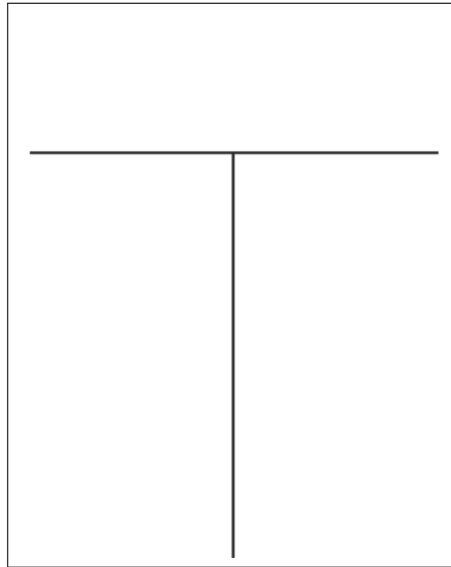
Evaluation Guidelines	Marks
Part 1: Modeling with Algebra Tiles	/21
Part 2: Solving Linear Equations Symbolically	/29
Total Marks	/50



Create an Equation Sheet

On a blank piece of paper, draw a horizontal line about one-third the way down. You'll put the equation in the top part and use the bottom part to set out the algebra tiles. In the bottom part, draw a vertical line half way across the page. This is our equation sheet.

It should look like this:



The vertical line down the middle of the bottom part represents the equals sign ($=$) in an equation.