

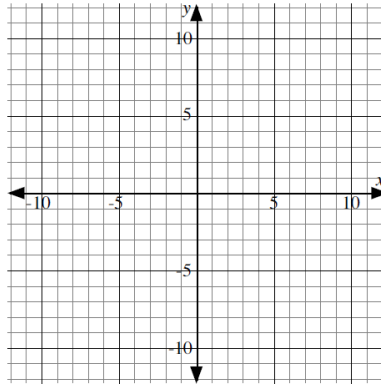
## Lesson 5.3: Graphing Relations

**Specific Outcome:** 4.5 – Draw a graph from a set of ordered pairs within a given situation, and determine whether the relationship between the variables is linear. 4.3 – Determine whether a graph represents a linear relation, and explain why or why not.

Consider: The relation represented by the equation  $y = 2x - 5$

- a) Identify the *independent* and *dependent* variables.
- b) Complete the first five rows of the table of values which shows some of the input values. Plot these ordered pairs on the grid, and connect the points. **Extend the line** in both directions.

Input (x)	Output (y)	Ordered pair (x, y)
-2		
-1		
0		
1		
2		



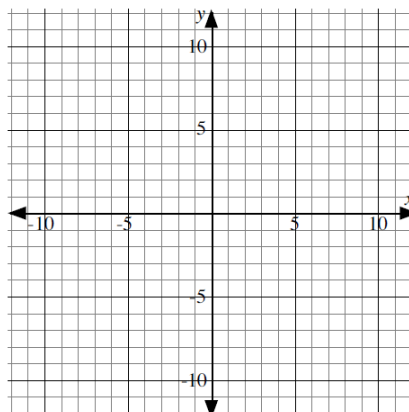
- c) Use the **graph** to determine the value of  $y$  when  $x = 6$ . \_\_\_\_\_
- d) Use the **equation** to determine the value of  $y$  when  $x = 6$ . \_\_\_\_\_ Compare this answer to b).
- e) Write the ordered pair from d) in the above table. \_\_\_\_\_
- f) Use the **graph** to determine the value of  $x$  when  $y = 3$ . \_\_\_\_\_
- g) Use the **equation** to determine the value of  $x$  when  $y = 3$ . \_\_\_\_\_
- h) Write the ordered pair from g) in the table. \_\_\_\_\_
- i) Complete the statement: Because the graph of this relation is a straight line, it is called \_\_\_\_\_ relation.

### Practice:

1. Consider the relation described by the equation:  $y = -x - 2$ .

- a) Identify the independent and dependent variables.
- b) Complete the first five rows of the table of values which shows some of the input values. Plot these ordered pairs on the grid, and connect the points. Extend the line.

Input (x)	Output (y)	Ordered pair (x, y)
-3		
-1		
0		
1		



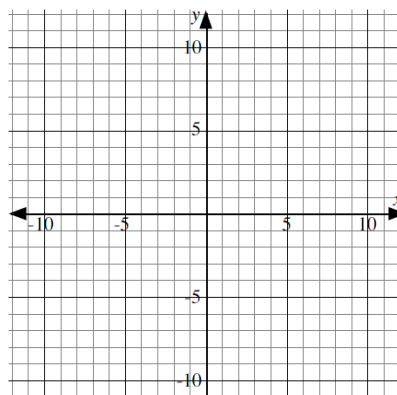
- c) Use the **graph** to determine the value of  $y$  when  $x = 5$ . \_\_\_\_\_
- d) Use the **equation** to determine the value of  $y$  when  $x = 5$ . \_\_\_\_\_
- e) Write the ordered pair from d) in the above table. \_\_\_\_\_
- f) Use the **graph** to determine the value of  $x$  when  $y = 0$ . \_\_\_\_\_
- g) Use the **equation** to determine the value of  $x$  when  $y = 0$ . \_\_\_\_\_
- h) Write the ordered pair from g) in the table. \_\_\_\_\_
- i) Is this a linear or nonlinear relation? Explain.

**HOMEWORK: #1abc** For the following relations:

- Complete the table of values choosing some of your own input values.
- Plot the ordered pairs on the grid, and connect the points with a continuous line.
- State whether the relation is linear or nonlinear.
- Answer the questions.

**A)  $y = -2x + 3$**

Input ( $x$ )	Output ( $y$ )	Ordered pair ( $x, y$ )
0		
3		

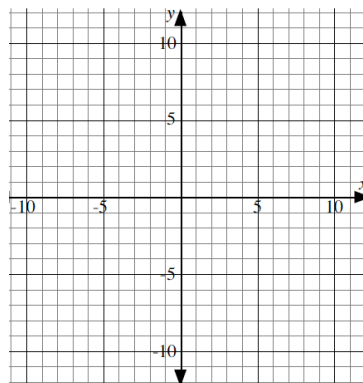


Using the **graph**, find the value of  $y$  when  $x = 6$ . \_\_\_\_\_

Verify using the equation:

**B)  $y = 0.5x - 8$**

Input ( $x$ )	Output ( $y$ )	Ordered pair ( $x, y$ )
-8		
0		
6		

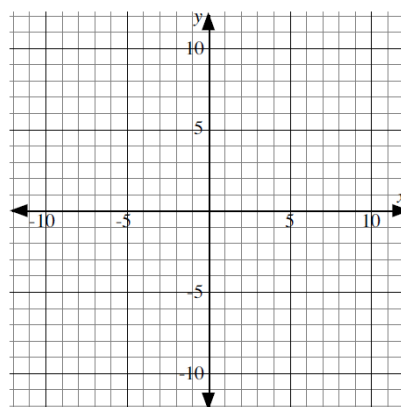


Using the **graph**, find the value of  $x$  when  $y = -11$ . \_\_\_\_\_

Verify using the equation:

c)  $y = -x^2 + 5$

Input (x)	Output (y)	Ordered pair (x, y)
4		
3		
2		
1		
0		
-1		
-2		
-3		
-4		

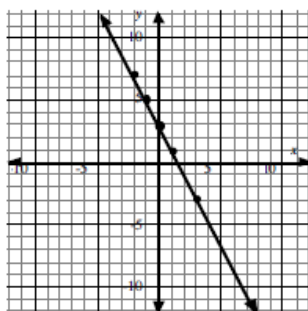


**ANSWER KEY:**

7. a) i) See table below. Inputs may vary.

Input (x)	Output (y)	Ordered pair (x, y)
-2	7	$(-2, 7)$
-1	5	$(-1, 5)$
0	3	$(0, 3)$
1	1	$(1, 1)$
3	-3	$(3, -3)$

ii) See grid below.

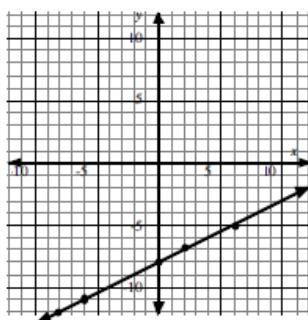


iii) linear

b) i) See table below. Inputs may vary.

Input (x)	Output (y)	Ordered pair (x, y)
-8	-12	$(-8, -12)$
-6	-11	$(-6, -11)$
0	-8	$(0, -8)$
2	-7	$(2, -7)$
6	-5	$(6, -5)$

ii) See grid below.

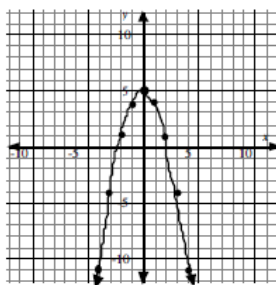


iii) linear

c) i) See table below.

Input (x)	Output (y)	Ordered pair (x, y)
4	-11	$(4, -11)$
3	-4	$(3, -4)$
2	1	$(2, 1)$
1	4	$(1, 4)$
0	5	$(0, 5)$
-1	4	$(-1, 4)$
-2	1	$(-2, 1)$
-3	-4	$(-3, -4)$
-4	-11	$(-4, -11)$

ii) See grid below.



iii) non-linear