

## 2 – Linear Relations

Focus: Analyze the graph of a linear relation.

### Main Ideas:

#### Warmup:

How do you plot points on a coordinate plane?

positive, go

Plot and label the points on the coordinate plane.

- a) (0, 0)      b) (5, 0)
- c) (0, 3)      d) (-4, 0)
- e) (3, 7)      f) (-8, 5)
- g) (0, -6)     h) (-4, -7)

Ex1

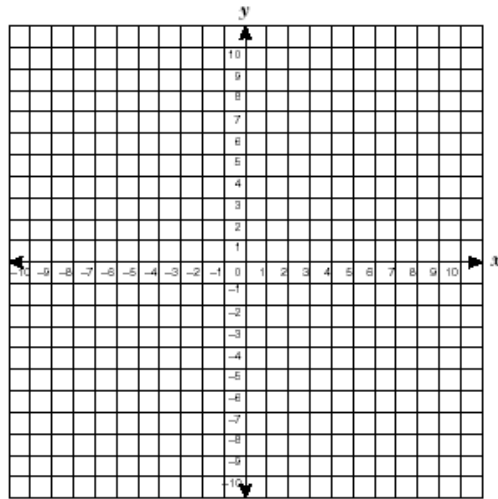
Suppose you were monitoring daily temperature. Three days ago, the temperature was  $-7^{\circ}\text{C}$ . Everyday since, the temperature has/will increase by  $3^{\circ}\text{C}$

- a) Complete the table.
- b) Graph the relation.
- c) What kind of pattern and/or relationships do you notice in the table and/or graph?

The  $x$  axis is \_\_\_\_\_ and the  $y$  axis is \_\_\_\_\_  
 The point will be given as, for example, (3, -5). The first number is **always** the  $x$  value and the second is the  $y$  value.

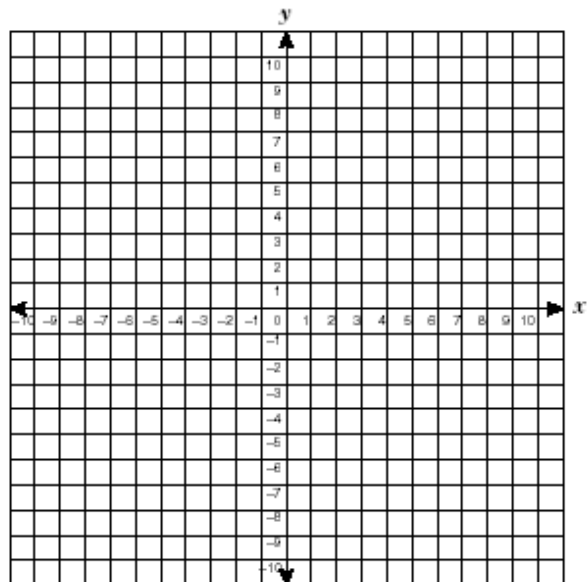
Start at (0, 0) on the graph (the middle). If  $x$  is positive, go \_\_\_\_\_.

If  $x$  is negative go \_\_\_\_\_. From there, count your  $y$ . If  $y$  is \_\_\_\_\_, and if negative, go \_\_\_\_\_. Then plot your point.



Day ( $x$ axis)	Temp ( $y$ )
-3	-7
-2	
-1	
0	
1	
2	
3	

On a table,  $x$  is always listed first, then  $y$ .



Ex2

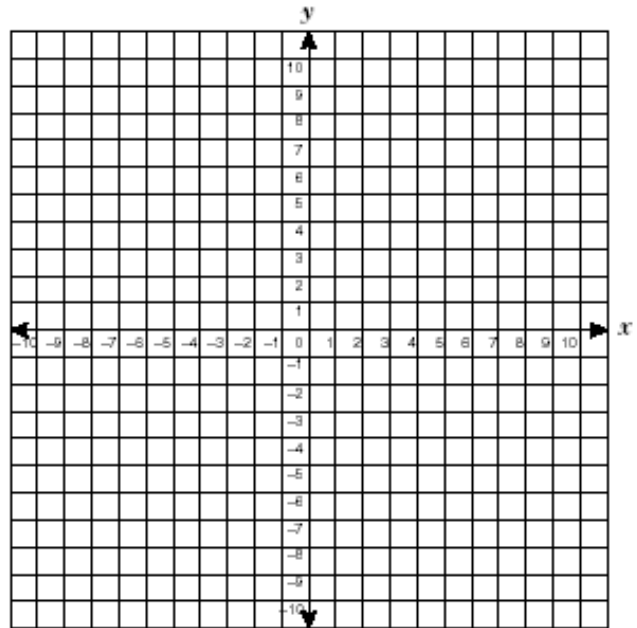
The table shows the cost of renting DVDs at an online store.

a) Graph the points, but don't draw a line.

b) Use the table to describe the pattern in the rental costs. How is this pattern shown in the graph?

c) Why don't we draw a line?

DVDs	Cost (\$)
1	2.50
2	5.00
3	7.50
4	10.00



Is the number of DVDs purchased related to the cost?

What is the equation for DVDs and cost in example 2? Use  $x$  for DVDs and  $y$  for cost.

What does the equation tell us?

Does cost depend on the number of DVDs, or does the number of DVDs depend on cost?

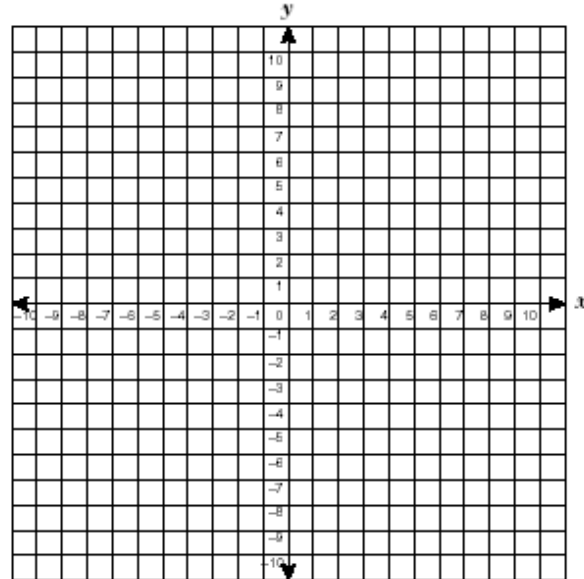
What is an independent variable, and what is a dependent variable?

What is a linear relation?

A relation has the equation  $y = 5 - 2x$ .

- a) Create a table of values for values of  $x$  from -2 to 4. Find  $y$  for each.
- b) Graph the relation. Should you join the points with a line?
- c) What patterns do you see in the table and graph?
- d) Is the relation linear?

$x$	$y$
-2	



If you know a relation is linear, how many points do you need to plot the line?

**Reflection:** If you were to plot a linear relation between number of km driven vs. cost of gas, which of the two would be the independent variable and which would be the dependent variable. **Explain.**