

5 Linear Relations

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Ch 4: Linear Relations

4.2 Linear Relations (Day 6)

Ex. 1: Investigating Slope-Intercept form of a Line

Fill out each table and graph the points for each equation.

a) $y = x + 4$

x	y
-2	-2 + 4 = 2
-1	-1 + 4 = 3
0	0 + 4 = 4
1	1 + 4 = 5
2	2 + 4 = 6
3	3 + 4 = 7

$(-2, 2)$
 $(-1, 3)$
 $(0, 4)$
 $(1, 5)$
 $(2, 6)$
 $(3, 7)$

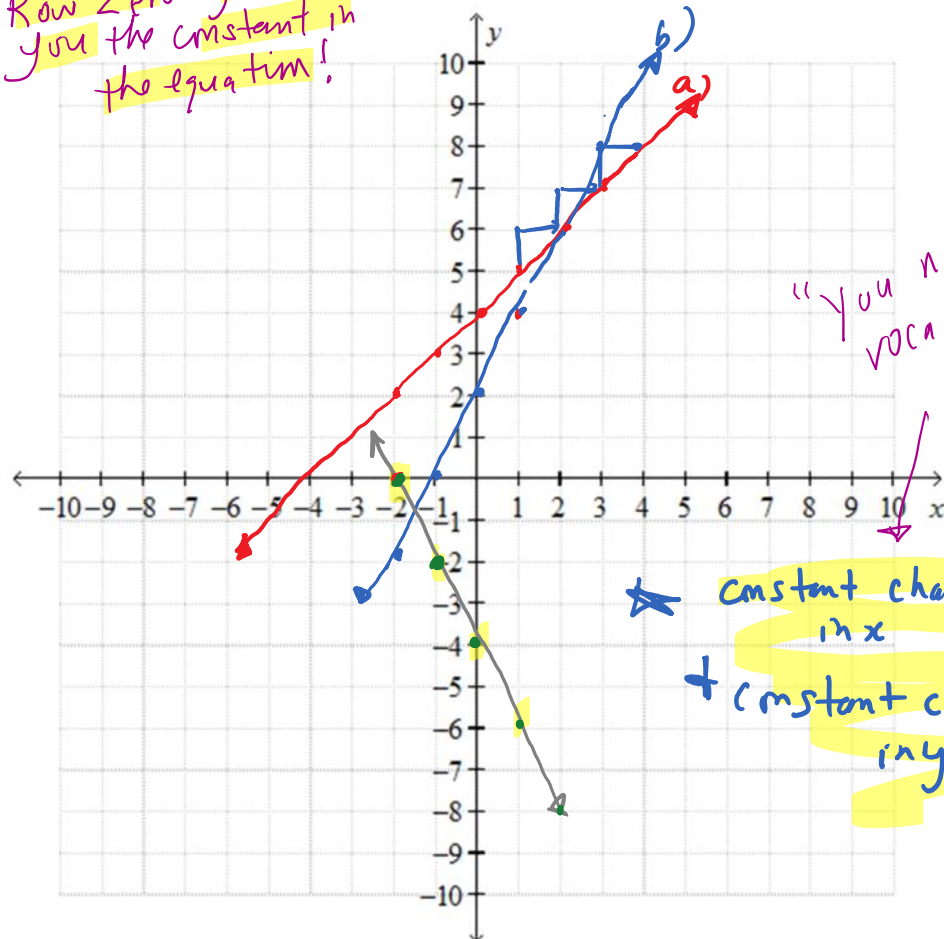
Row "Zero" gives you the constant in the equation!

b) $y = 2x + 2$

x	y
-2	2(-2) + 2 = -2
-1	2(-1) + 2 = 0
0	2(0) + 2 = 2
1	2(1) + 2 = 4
2	2(2) + 2 = 6
3	2(3) + 2 = 8

c) $y = -2x - 4$

x	y
-2	-2(-2) - 4 = 0
-1	-2(-1) - 4 = -2
0	-2(0) - 4 = -4
1	-2(1) - 4 = -6
2	-2(2) - 4 = -8
3	-2(3) - 4 = -10



"You need this vocab to explain LINEAR Relations!"

★ constant change in x
 + constant change in y

A **relation** is a **relationship between 2 quantities**, like x and y .

Linear Relation:

- points (x, y) form a **straight line**
- **constant change in x** produces a **constant change in y**

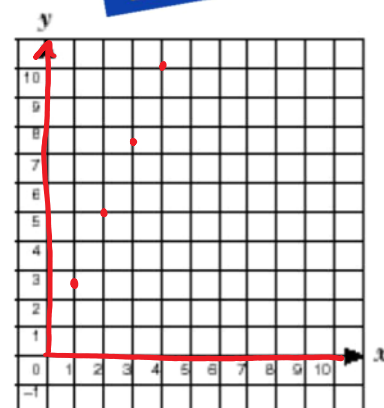


Ex. 2: The table shows the cost of renting DVDs at an online store.

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

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

$$y = 2.5x + 0$$



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

- straight line
- constant change in x of 1 gives a constant change in y of \$2.50

- c) Why don't we draw a line?

No, because you can't rent half a DVD! (so don't connect the dots).

Investigate: If there is **no story** (just an equation), then **connect the dots!**

Is the number of DVDs purchased related to the cost?

yes

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

$$y = 2.5x^1$$

degree 1 is a line!

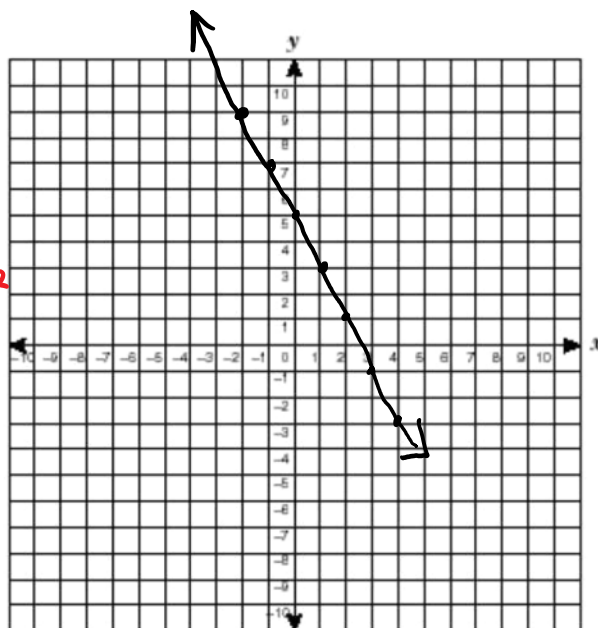
What does the equation tell us?

- Cost!
- Linear

Ex. 3: A relation has the equation $y = 5 - 2x$

- a) Create a table of values for x from -2 to 4. Find the y value for each.

	x	$y = 5 - 2x$
$(-2, 9)$	-2	$5 - 2(-2) = 5 + 4 = 9$
	-1	$5 - 2(-1) = 5 + 2 = 7$
	0	5
	1	3
	2	1
	3	-1
	4	-3



- b) Graph the relation.
Should you join the points with a line?

Yes! There's no story where it wouldn't make sense not to!

- c) What patterns do you see in the table and graph?

• straight line

- d) Is the relation linear? Explain why.

constant change in $x + y$!

Note: Defn Oblique line: not horizontal or vertical!

Assignment: Sec 4.2, p. 170

★ 4,5,7c

★★ 9, 10acf, 13

★★★ 14, 15