

Created by Olivia T

Warmup 10/(The number above the letter "U" on the "Numbers Everywhere!" poster)

- **MAKE SURE THERE IS A WHITEBOARD, MARKER, ERASER IN YOUR DESK**

1) Copy the diagram. How many squares are in the diagram? The squares can be any size.



Honorable Mentions: October 3rd

- Donovan A - $\frac{(11^2 - (3^4 - 80))}{40}$
- Brooks W - $\sqrt{\frac{504}{56}}$
- Sanaa W - $13 - 100 \div 10$
- Eleanor B - $\sqrt{\pi^2}$ rounded to the nearest whole #
- Cydney H - $\left(\frac{3}{1}, \frac{1}{3}, \frac{3}{1}, \frac{1}{3}\right) + 2$
- Kimberly O - # of days until the first day of fall break

REMINDERS:

- The Linear Quiz retake will be done in class on Thursday (you can schedule an earlier one if you like)
- You **MUST** complete the Extra Practice worksheet in order to do the retake
- I will give them back tomorrow and you will do corrections
- OPTIONAL: $y = mx + b$ Green sheet – strongly suggested for people who struggled on the BACK of the quiz
- OPTIONAL: watch the online videos from the pink sheet
- You do not need to fill out a retake form for this retake – I will just get a list of everyone who's planning on retaking

REMINDERS:

- The deadline for the Functions quiz is also Thursday.
- For this quiz, you DO need to fill out a retake form.
- You **MUST** meet with me no later than Wednesday

ALEKS Progress Grade

- Last night, I entered in a grade based on how much progress you've made this 9 weeks.
- **+5% or more:** 100
- **+4% :** 93
- **+3%:** 85
- **+2%:** 70
- **+1%:** 50
- **+0%:** 0

ALEKS Progress Grade

- **THIS GRADE CAN STILL IMPROVE.** Any extra ALEKS you do TODAY, WEDNESDAY, OR THURSDAY (even Thursday night) will count and I will update your progress grade.
- By the way, the next 30 minutes of ALEKS is not due this Monday, but instead the day you get back from fall break.

Top Gainers: 1st 9 Weeks

Tied for 3rd place (1 piece of candy)

Ryne D (+8%)

Olivia W (+8%)

Tied for 2nd place (2 pieces of candy)

Kimberly O (+9%)

Kousci T (+9%)

Top Gainer (3 pieces of candy)

Katie M (+11%)

TODAY'S TOPICS:

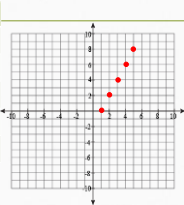
- Determining if a TABLE is linear
- Writing a linear equation from a table

x	y
-2	-1
-1	2
0	5
1	8
2	11

$$y = 3x + 5$$

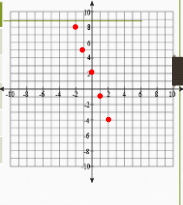
Is it linear?

x	y
1	0
2	2
3	4
4	6
5	8



Yes

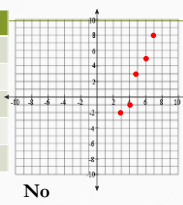
x	y
-2	8
-1	5
0	2
1	-1
2	-4



Yes

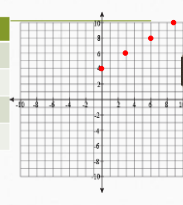
Is it linear?

x	y
3	-2
4	-1
5	3
6	5
7	8



No

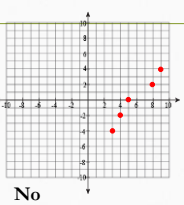
x	y
0	4
3	6
6	8
9	10



Yes

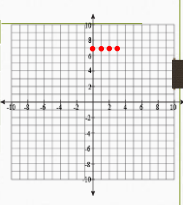
Is it linear?

x	y
3	-4
4	-2
5	0
8	2
9	4



No

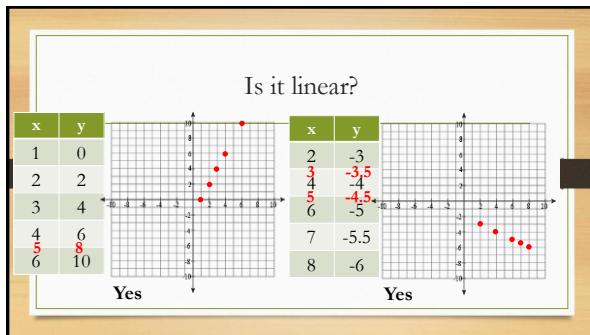
x	y
0	7
1	7
2	7
3	7



Yes

To determine if a table is linear:

- Both x and y must have a constant rate of change!!!



OBJECTIVE 2:

Writing an equation from a table

IF IT IS LINEAR...

- You can always write an equation in the form $y = mx + b$ to match the table.

This is basically the same as “guess my rule”!

- Write the equation:

x	y
2	7
3	11
4	15
5	19
6	23
- Remember, if y increases by a constant amount, then x is multiplied by that number in the equation!!!
- $y = 4x + \underline{\hspace{1cm}}$
- Pick an x -value and multiply it by 4. What would the other step have to be to get the right output?
- $y = 4x - 1$

3 Examples

- Write the equation:

x	y
2	15
3	17
4	19
5	21
6	23

 $y = 2x + 11$

x	y
4	1
5	$1\frac{1}{2}$
6	2
7	$2\frac{1}{2}$
8	3

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

x	y
-6	17
-5	15
-4	13
-3	11
-2	9

 $y = -2x + 5$

What about this?

- Write the equation:

x	y
4	7
6	13
8	19
10	25
12	31
- REMEMBER: The “multiplying” trick only works if your table has CONSECUTIVE values of x !

x	y
4	7
5	10
6	13
7	16
8	19
9	22
10	25
11	28
12	31

- ONE STRATEGY: Fill in the missing rows!
- THINK: What is halfway between 7 and 13?

- You can see that if x increases by 1, y increases by 3.

- $y = 3x + \underline{\hspace{1cm}}$
- $y = 3x - 5$

x	y
1	-6
4	6
5	10
6	14
7	18
10	30
13	42

- If the table skips several rows, it can be more difficult to find the “missing numbers”
- If x increases by 3, y increases by 12
- THEREFORE: if x increases by 1, y will increase by 4.
- STRATEGY: Find the “change in y” and divide it by the “change in x”
- Sound familiar???

REMEMBER,

- The “multiplying number” is really the **slope**.
- If the x-values are consecutive numbers, the slope will simply be the rate of change for y.
- If the x-values are NOT consecutive numbers, just do $\frac{\text{change in } y}{\text{change in } x}$ to find the slope.

MORE EXAMPLES:

- Write the equation:

x	y
0	-4
3	11
6	26
9	41
12	56

$$\text{Slope} = \frac{15}{3} = 5$$

$$y = 5x - 4$$

x	y
2	9
4	5
6	1
8	-3
10	-7

$$\text{Slope} = \frac{-4}{2} = -2$$

$$y = -2x + 13$$

x	y
6	5
9	6
12	7
15	8
18	9

$$\text{Slope} = \frac{1}{3}$$

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

ONE MORE STRATEGY TO FIND SLOPE:

x	y
3	50
6	32
9	14
12	-4
15	-22

- Pick two rows and write the coordinates.
- (3, 50); (6, 32)
- Now use the slope formula:
- $\frac{32-50}{6-3}$
- $= \frac{-18}{3} = -6$

Another strategy...

x	y
0	-4
3	11
6	26
9	41
12	56

$$y = 5x - 4$$

- Remember, the “add/subtract” number is the y-intercept.
- The y-intercept is always on the y-axis. What is true about EVERY POINT on the y-axis?
- Every y-intercept has an x-value of 0.
- This means that, to find the y-intercept, you just have to figure out the y-value when x is 0.

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

Alternate strategy: finding the y-intercept

$y = -6x + 68$

x	y
0	68
3	50
6	32
9	14
12	-4
15	-22

x	y
0	3
3	4
6	5
9	6
12	7
15	8
18	9

x	y
-6	17
-5	15
-4	13
-3	11
-2	9
-1	7
0	5

$y = -2x + 5$

SUMMARIZING:

x	y
4	7
6	15
8	23
10	31
12	39

$y = \underline{\hspace{1cm}}x + \underline{\hspace{1cm}}$

- If "x" increases by 1, this number will be the rate of change for y
- If not, you can try to "fill in the missing numbers" to find the rate of change for y
- You can also do $\frac{\text{change in } y}{\text{change in } x}$ to find it
- Or, you can use $\frac{y_2 - y_1}{x_2 - x_1}$ to find it
- To find this number, you can multiply the slope by any "x" and figure out what the second step would have to be
- This number will also be the y-value if the x-value is 0. You can extend the pattern in the table to find it.