Warmup 10 $/\left(8 \div \dfrac{1}{2}\right)$

Created by Mr. Lischwe

FOR EACH: Find the constant rate of change. Also, find the "original amount" if there is one.

1)

Minutes	Sentences
6	90
9	105
12	120
15	135

Rate of change
= 5 sentences per minute

Original amount = 60 sentences

y = 5x+60

2)

Age	Weight (lbs)
7	28
8	32
9	36
11	44

Rate of change
= 4 pounds per year

Original height = 0 in

y = 4x

3)

Age	Height (in)
3	4.5
4	6
5	7.5
6	9

Rate of change
= 1.5 inches per year

Original height = 0 in

y = 1.5x

Minutes	Sentences
6	90
9	105
12	120
15	135

$y = 5x+60$

Age	Weight (lbs)
7	28
8	32
9	36
11	44

$y = 4x$

Age	Height (in)
3	4.5
4	6
5	7.5
6	9

$y = 1.5x$

Back to your guided notes from yesterday!!!

Proportional Relationships

- **A <u>proportional relationship</u> is a special kind of linear relationship.**

- **It's proportional when it is linear AND the original value (y-intercept) is 0!**

- **Proportional:** $y = mx$ (no b!!!)

- **(Proportional relationships = JUST MULTIPLYING)**

Comparing:

- **y = mx + b**

  If you plug in "0" for x, you will get "b" as your y-value.

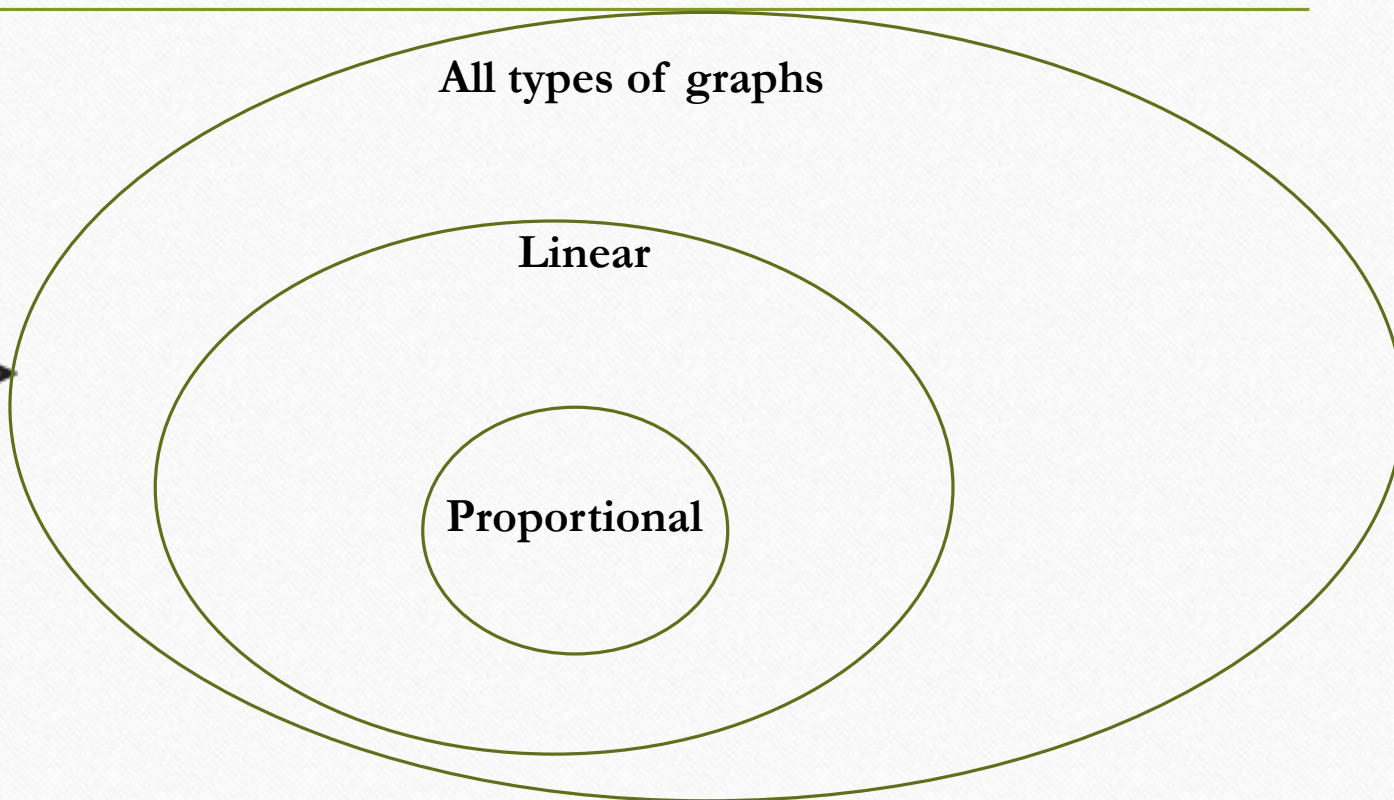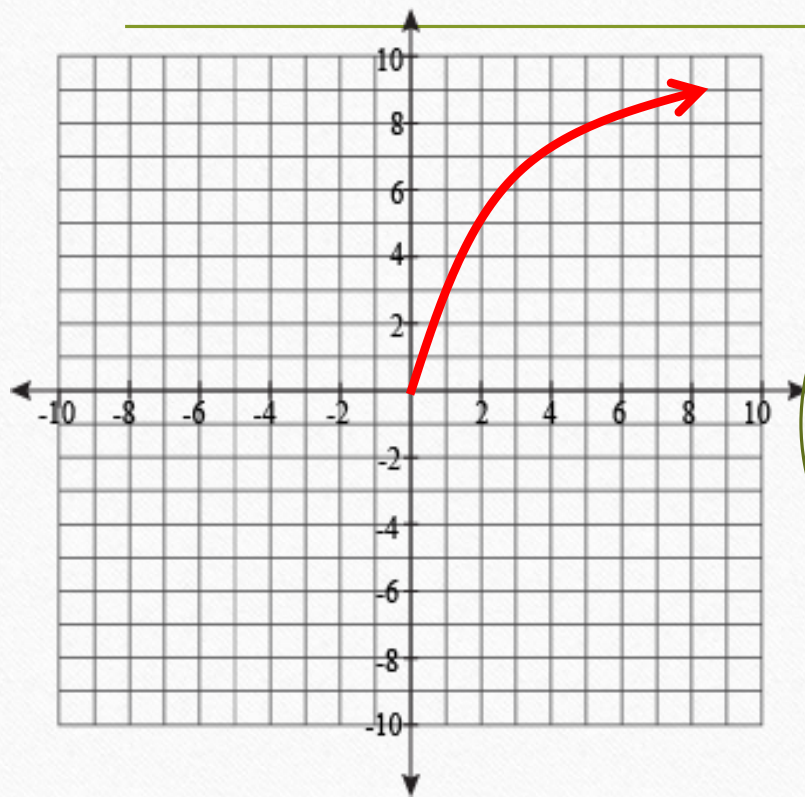 (I had $100, and I earned $12 more per hour)

- **y = mx**

  If you plug in "0" for x, you will get zero!!!

  (I had no money, and I earned $12 per hour)

NOT PROPORTIONAL!!!

- Proportional relationships are a SPECIAL TYPE of linear. It is **impossible** to be proportional but not linear.

All types of graphs

Linear

Proportional

Find the constant rate of change. Also, find the "original amount" if there is one.

Weeks	Books Read
10	11
20	22
30	33
40	44

Rate of change = 1.1 books per week

(Jim Kwik says this is about how many books CEOs read)

Original amount = 0 books

y = 1.1x

Proportional!

Find the constant rate of change. Also, find the "original amount" if there is one.

Years	Weight (lbs)
6	31
10	47
14	63
18	79

Rate of change = 4 lbs/year

Original weight = 7 lbs

$y = 4x + 7$

Linear but not proportional

Find the constant rate of change. Also, find the "original amount" if there is one.

Minutes	Meigs Moolah signed
2	24
5	60
7	84
8	96

Rate of change = 12 MM per minute

Original amount = 0

$y = 12x$

Proportional!

Find the constant rate of change. Also, find the "original amount" if there is one.

Years	Height
2	2'10"
4	3'4"
7	3'10"
11	4'6"

Not a constant rate of change!!!

2 to 4: 3 inches per year
4 to 7: 2 inches per year

Not possible to write a y = mx + b equation.

Find the constant rate of change. Also, find the "original amount" if there is one.

Minutes	Problems left
3	74
5	68
7	62
8	59

Rate of change = -3 problems per minute

Original amount = 83

y = -3x + 83 OR y = 83 – 3x

Find the constant rate of change. Also, find the "original amount" if there is one.

x	y
4	2
6	5
8	8
10	11

Rate of change = 3/2 or 1.5

Original amount = -4

$y = 1.5x - 4$ **OR** $y = 3/2\ x - 4$

HOMEWORK (Due tomorrow)

- Worksheet: Writing Equations from a Table