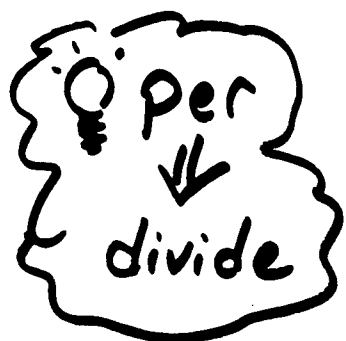


# BE-Algebra I | Monday 10-20-08

- ① DEFINE RATE.
  - ② Find the slope between  $(-a, -b), (a, b)$
  - ③ GRAPH:  $y = \frac{1}{5}x$
- 

RATE  $\Rightarrow$  the ratio of two  
(a fraction)  
measurements having different  
units of measure.



ⓔx  $\frac{\text{Miles}}{\text{Hour}}$

ⓔx  $\frac{\text{Cows}}{\text{truck}}$

ⓔx  $\frac{\text{Pounds force}}{\text{Square inch}}$

BE...

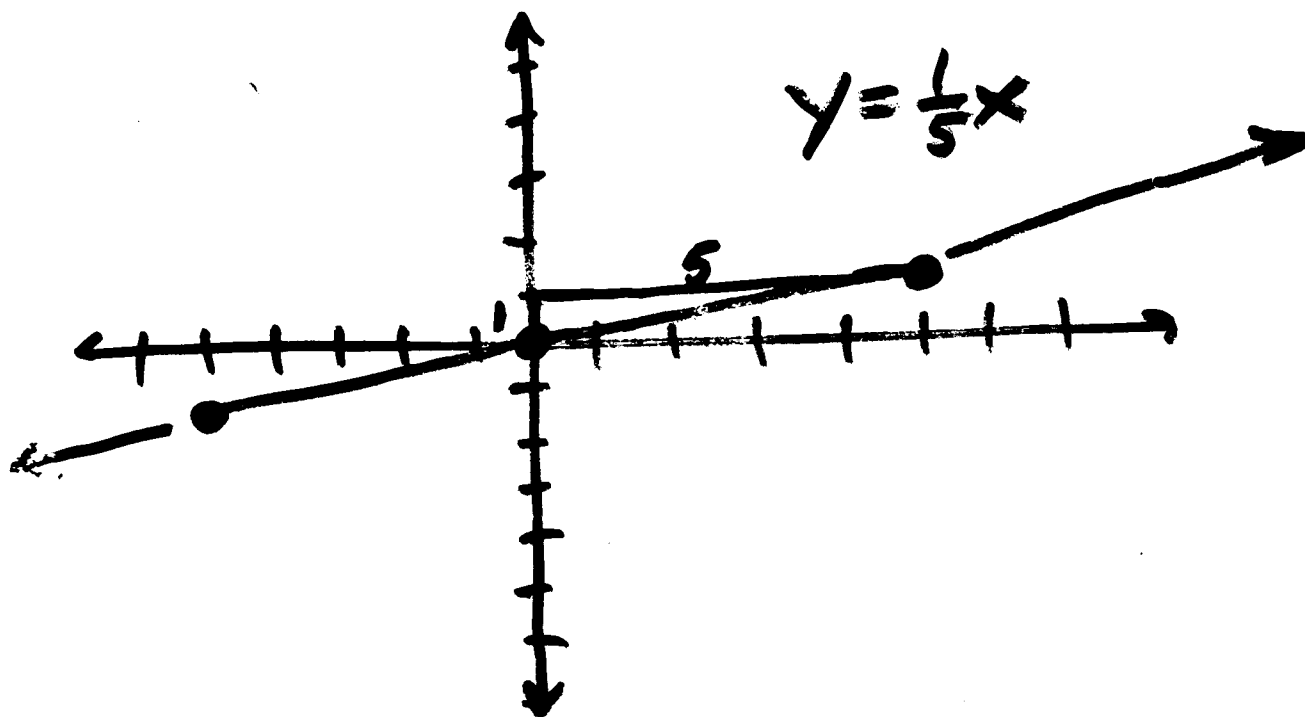
②  $(-a, -b), (a, b)$

$$\frac{b - (-b)}{a - (-a)} = \frac{b+b}{a+a} = \frac{2b}{2a} = \boxed{\frac{b}{a}}$$

③ Graph:  $y = \frac{1}{5}x$

begin at  $b = 0$

move by slope  $= \frac{1}{5} = \frac{\text{rise}}{\text{run}}$  



A LINEAR EQUATION CAN BE USED TO MODEL MANY REAL LIFE SITUATIONS.

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THESE ARE OFTEN "QUADRANT I" problems — the  $(+, +)$  quadrant. Why?

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The  $y$ -intercept is the STARTING value, it is what you get when  $x = 0$  since  $y = mx + b$   
 $y = m(0) + b$   
 $y = b$

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THE SLOPE,  $m$ , IS THE RATE

“Q” LOOK FOR “per”, THIS USUALLY will identify the slope

# MODEL WITH A LE → Linear Equation

(EX) It costs 12 to get into a fair and \$2 per ride.

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💡 TIP per means divide so this is a good clue THAT the 2 is a rate ( $\frac{\text{dollars}}{\text{ride}}$ )  
" SLOPE

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The "12" is the "STARTING VALUE"

WRITE THIS!

↙  
Y-intercept = b

$$y = mx + b$$

↑  
RATE

↑  
STARTING VALUE, if  $x = 0$   
 $y = 12$

$$y = 2x + 12$$

THE UNITS MUST ALWAYS WORK out, check the equation with some simple numbers.

Ex) Assume 3 rides, find cost.

$$y = 2 \frac{\text{dollars}}{\text{ride}} (3 \text{ rides}) + 12 \text{ dollars}$$

$$y = 6 \text{ dollars} + 12 \text{ dollars}$$

$$\boxed{y = 18 \text{ dollars}} \quad \checkmark$$

WATCH THE sign of the slope,

if AS  $x \uparrow$ ,  $y \uparrow \Rightarrow$  slope is  $\oplus$

if AS  $x \uparrow$ ,  $y \downarrow \Rightarrow$  slope is  $\ominus$

# PRACTICE - MODEL WITH A LINEAR EQUATION

Pg 276  
#40-43

$$y = mx + b$$

- ④④ You RENT A bicycle for \$20  
PLUS \$2 per hour.

$$C = 2h + 20$$

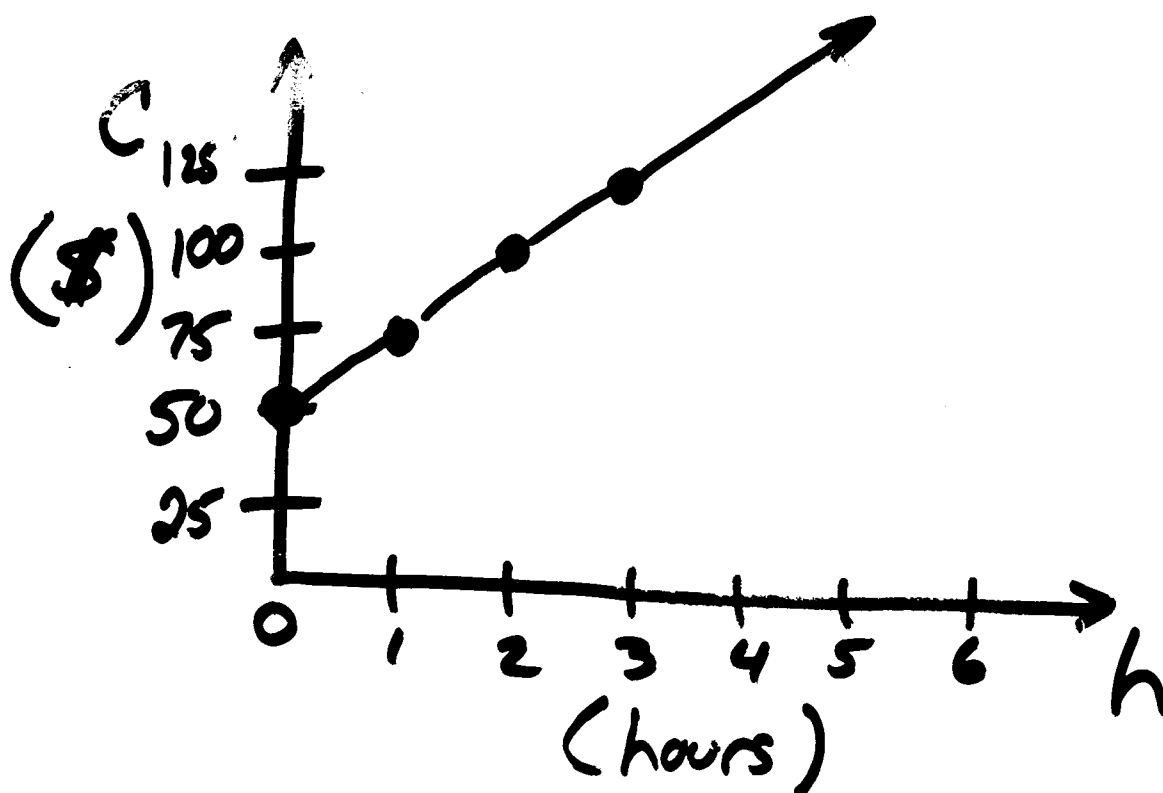
↑                      ↑                      ↑  
dollars =  $\frac{\text{dollars}}{\text{hr}} \cdot \text{hr} + \text{dollars}$  ✓

- ④① AN AUTO REPAIR SHOP CHARGES  
\$50 PLUS \$25 per hour

$$C = 25h + 50$$

↑  
GRAPH THIS

$$C = 25h + 50$$



NOTE: QUADRANT I, STARTING VALUE IS \$50

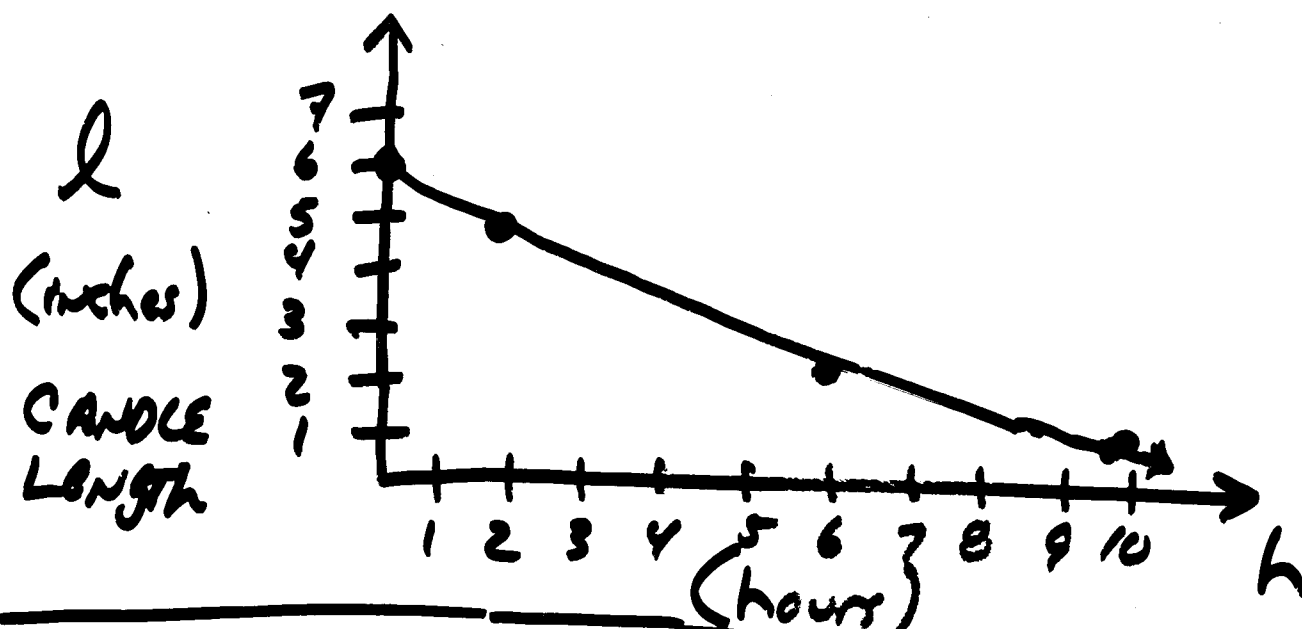
4) A candle is 6 inches tall and burns at  $\frac{1}{2}$  inch per hour

$$l = \frac{1}{2}h + 6$$

↑                      ↑                      ↑  
inches =  $\frac{\text{inches}}{\text{hr}} \cdot \text{hr} + \text{inches}$

GRAPH THIS...

$$l = -\frac{1}{2}h + 6$$



When is  $l = 0$ ? (the  $x$  intercept)

- (43) The temperature is  $15^\circ$  and is expected to FALL 2 degrees each hour during the night

$$T = -2h + 15$$

degrees Fahrenheit =  $\frac{\text{deg F} \cdot \text{hr}}{\text{hr}} + \text{deg F}$