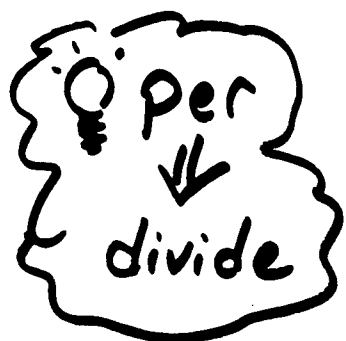


BE-Algebra I | Monday 10-19-09

- 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...

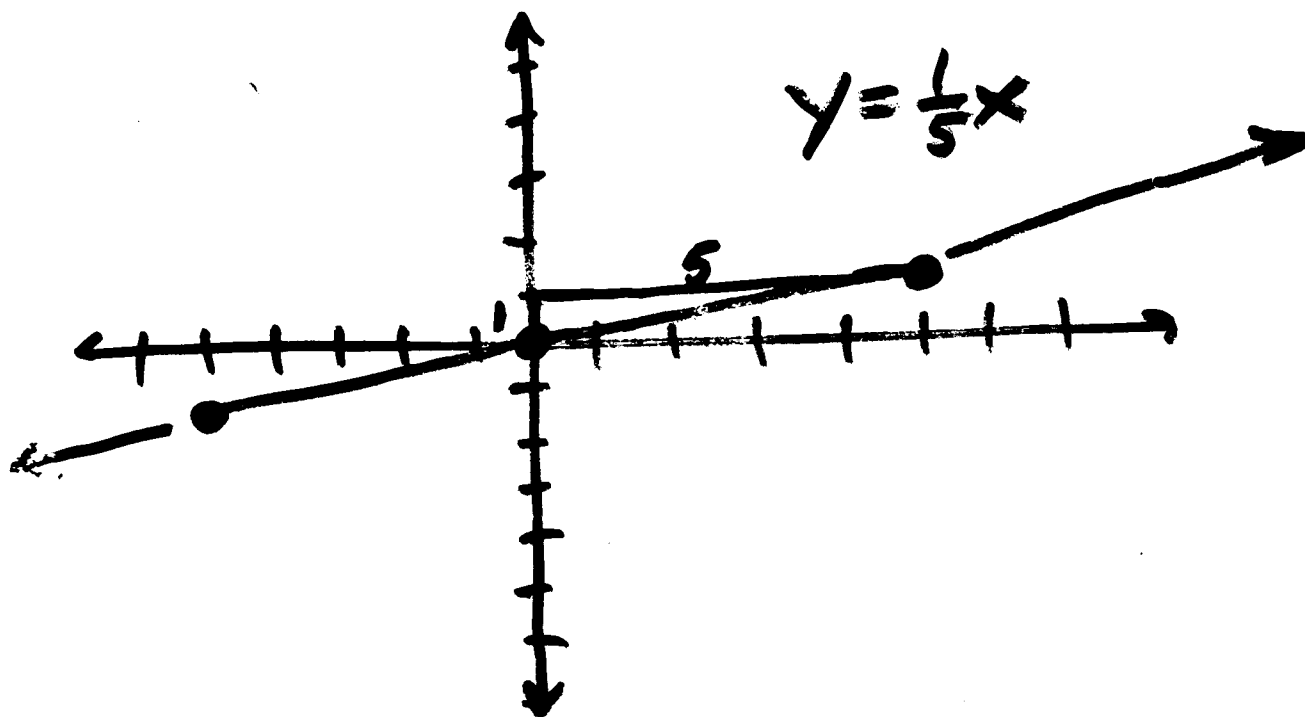
② $(-a, -b), (a, b)$

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

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.

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

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

$$y = m(0) + b$$

$$y = b$$

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.

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

The "12" is the "STARTING VALUE"

WRITE THIS!

↙
Y-intercept = b

$$y = mx + b$$

↑
RATE

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

$$\boxed{y = 2x + 12}$$

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

$$y = mx + b$$

- ④① You RENT A bicycle for \$20 PLUS \$2 per hour.

$$C = 2h + 20$$

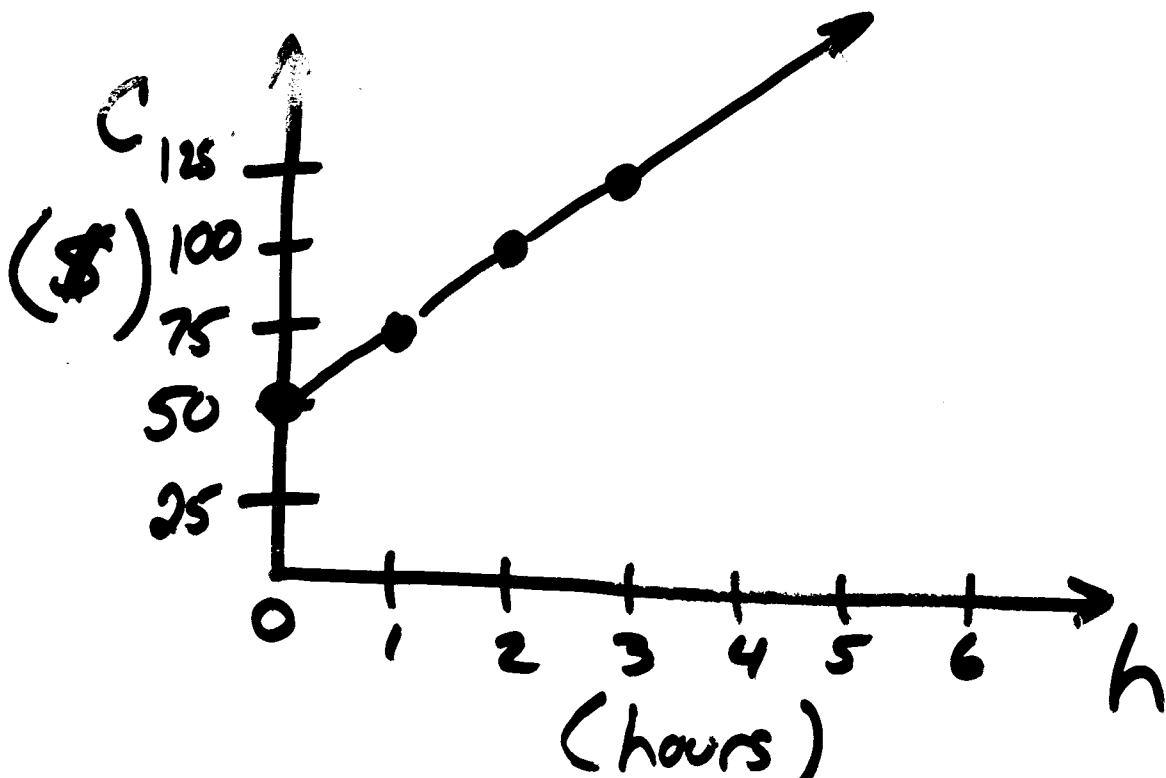
↑ ↑ ↑
dollars = $\frac{\text{dollars}}{\text{hr}} \cdot \text{hr} + \text{dollars}$ ✓

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

$$C = 25h + 50$$

↑
GRAPH THIS

$$C = 25h + 50$$



Note:

Quadrant I Problem. Starting value is \$50.

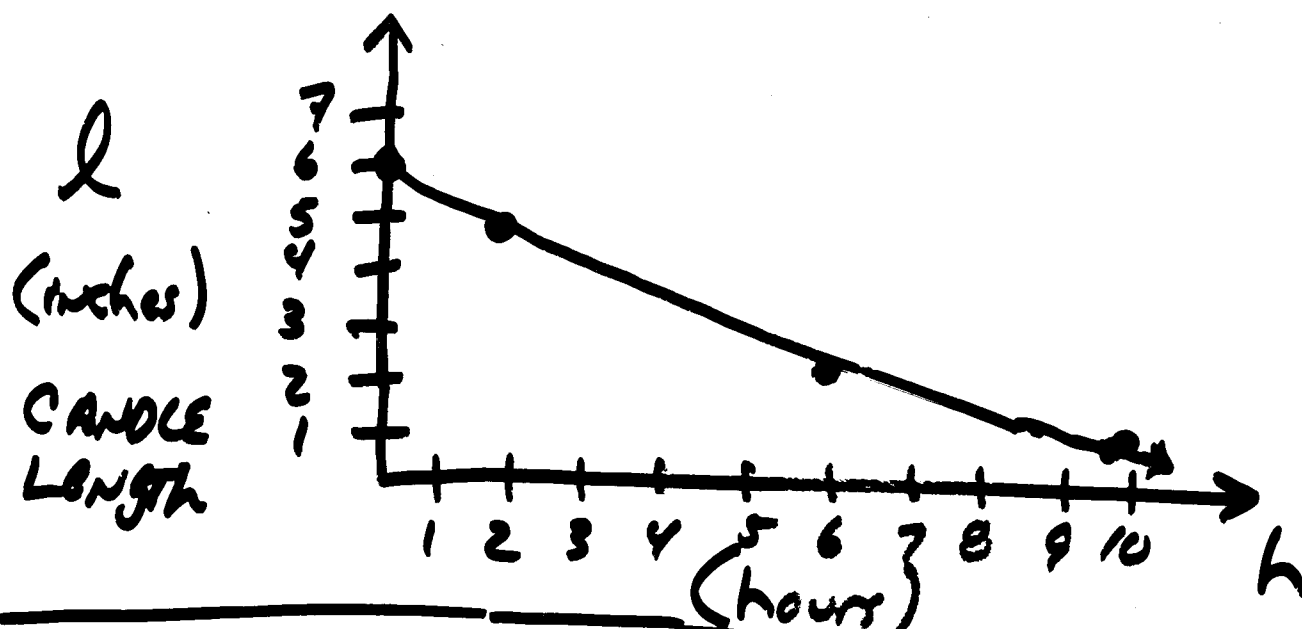
- (42) A candle is 6 inches tall and burns at $\frac{1}{2}$ inch per hour

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

↑ ↑ ↑
 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° and is expected to FALL 2 degrees each hour during the night

$$T = -2h + 15$$

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