REEF question.

2 - 3^{30} is $3/2$ hrs.

dist = rate x time.

= $30 \text{ mi/hr} \cdot 3/2 \text{ hrs}$

= 45 miles.

New position is

27 + 45 = 72 mi.

(H)

8/31/16

From last time -

Find the points on the x-axis that are 13 units from (7, 5)

Solution -

$(x-7)^2 + (0-5)^2 = 13^2$

$(x-7)^2 + 25 = 169$

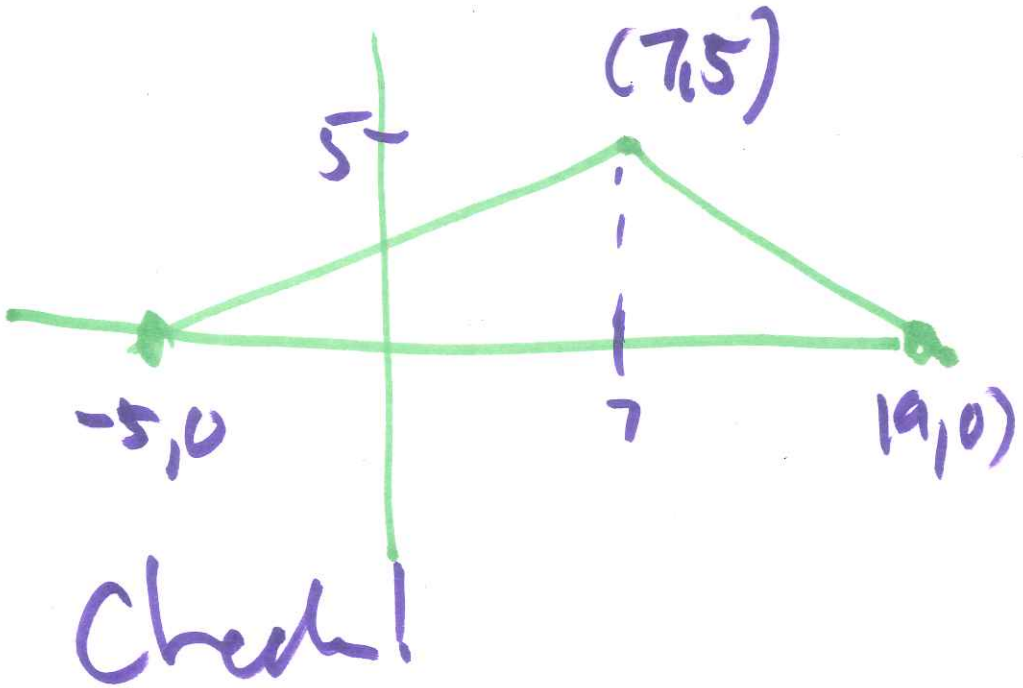
$(x-7)^2 = 144$

$$x-7 = \pm\sqrt{144}$$

$$= \pm 12$$

$$x = 7 \pm 12.$$

$$= 19 \text{ or } -5.$$



Check!

What is the graph of the equation

$x^2+6x+9+y^2=0$?

$+9$

$(x+3)^2+y^2=9.$

$(x-(-3))^2+y^2=3^2$

$\sqrt{(x-(-3))^2+y^2}=\sqrt{3^2}$

$=3$

This is the equation of all points (x,y) of dist. exactly 3 from $(-3,0)$.

Circle w/ radius ~~(-3)~~ 3 and center $(-3,0)$.

$(x-h)^2+(y-k)^2=r^2$ is the equation of the circle with center (h,k), radius r.

Equationing a line.

Start at mile b

drive for t hours

at speed r

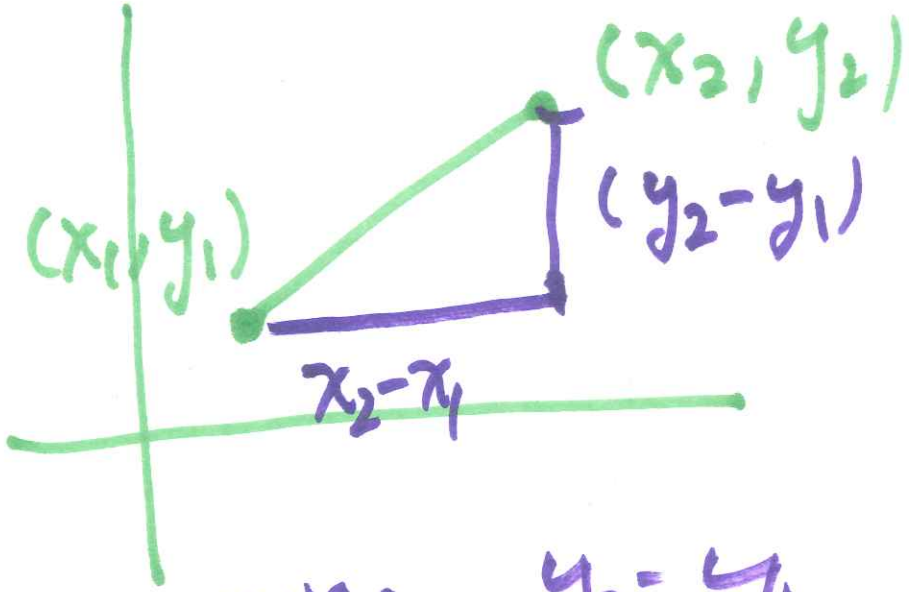
our location is

$b + rt$. = location

If we have 2 points (x_1, y_1) (x_2, y_2) then the slope of the line segment joining them is

$$\frac{y_1 - y_2}{x_1 - x_2} = m$$

$$= \frac{y_2 - y_1}{x_2 - x_1}$$



$$m = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1}$$

REEF #2

$$\frac{4 - k}{2 - 4} = -3$$

Solve for k.

$$4 - k = (-3)(-2)$$

$$= 6$$

$$-k = 6 - 4$$

$$k = -2$$

A line is the set of all points (x, y) of slope m from a given point (x_1, y_1)

Point-Slope Form of a line.

$$\frac{y - y_1}{x - x_1} = m.$$

$$\boxed{(y - y_1) = m(x - x_1)}$$

REEF -

Line thru

(20, 0) & (0, 30)

$$m = \frac{30-0}{0-20} = -3/2$$

Line is

$$y - 0 = -\frac{3}{2}(x - 20)$$

$$y = -\frac{3}{2}x + 30$$

- Check.

Does (30, 0) lie on this line?

$$30 \stackrel{?}{=} -\frac{3}{2} \cdot 0 + 30$$ ✓

Slope-intercept form. Line w/ slope m passing thru (0, b)

$y - b = m(x - 0)$

$\boxed{y = mx + b}$

Geometry -

$m = 0$ - Horizontal line.

$m > 0$ - rise as we move to the right.

$m < 0$ decrease as we move to the right.

Line thru $(7, 10)$ and $(7, 11)$.

$$m = \frac{11 - 10}{7 - 7} = \frac{1}{0}$$

m undefined means the line is Vertical. $(x = 7)$

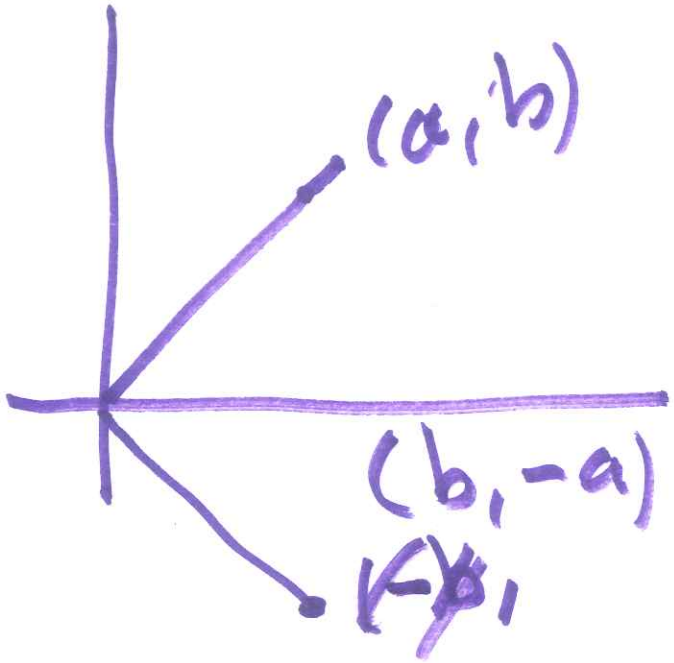
Parallel & perpendicular lines.

Parallel lines have the same slope.

$$m = \frac{(b-0)}{(a-0)}$$

$$m_\perp = \frac{-a-0}{b-0}$$

$$= -a/b = \frac{-1}{m}.$$



$$m_\perp = \frac{-1}{m}.$$