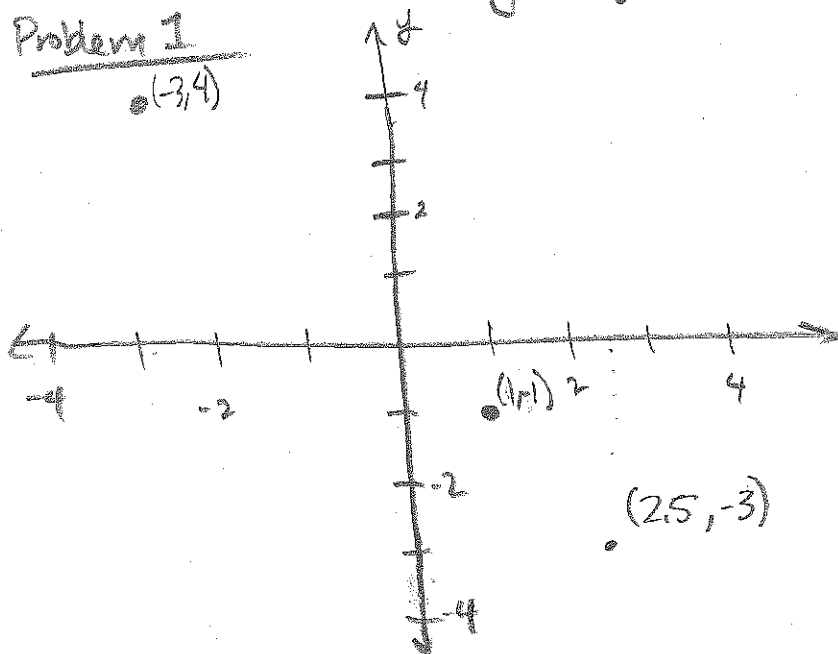
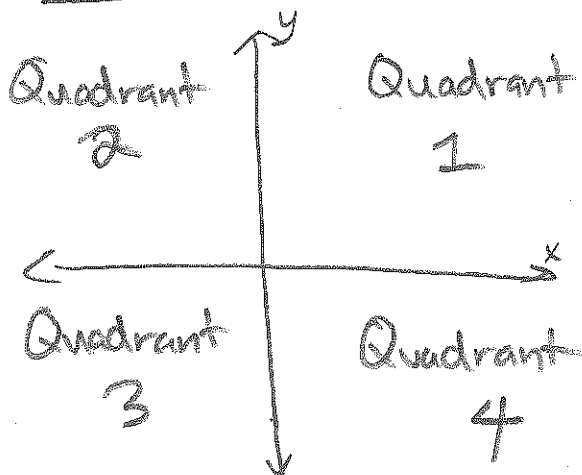


Worksheet #1 Thursday August 28th

Problem 1



Problem 2



If $P(a, b)$ is in the second quadrant, then $a < 0$ & $b > 0$.

If $P(a, b)$ is in the fourth quadrant $a > 0$ & $b < 0$.

Problem 3

Recall that two lines are perpendicular if the product of the slopes equals minus one. In other words if the slopes are m_1 & m_2 respectively, then $m_1 m_2 = -1$ implies the two lines are perpendicular. Two lines are parallel if $m_1 = m_2$.

a) $-\frac{3}{5} \cdot 6 \neq -1$ so neither

b) $\frac{9}{8} \left(-\frac{8}{9}\right) = -1$ so perpendicular.

c) $\frac{7}{10} \left(\frac{-10}{7} \right) = -1$ so perpendicular

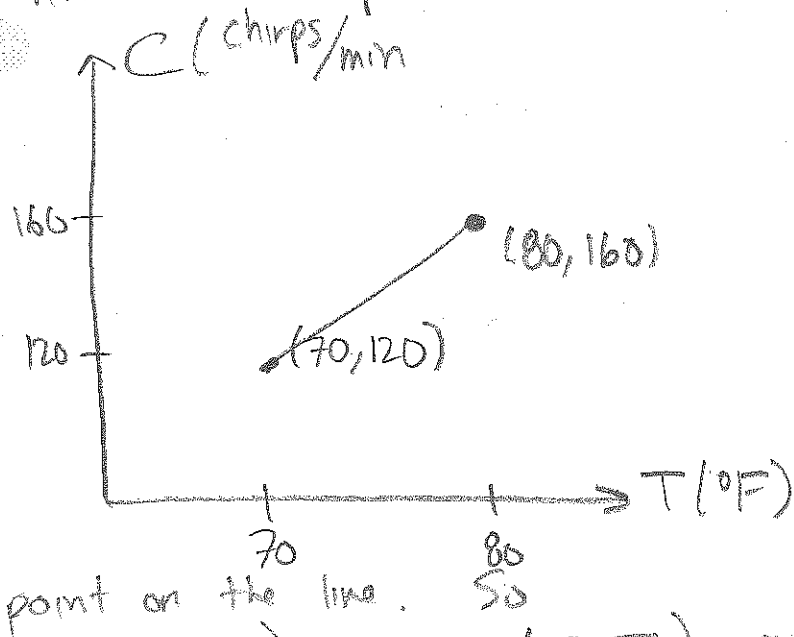
d) the slopes are equal so they are parallel

e) $-13.103 \neq -1$ so neither parallel nor perpendicular

f) the slopes are equal so parallel

Problem 4

We're explicitly told that the relationship is LINEAR. Therefore we're finding the equation of a line. To determine the equation of a line we need either 2 points or a point and a slope. Let T denote the temperature in $^{\circ}\text{F}$ and let C denote the number of chirps/min.



$$\text{Slope} = \frac{\Delta C}{\Delta T} = \frac{160 - 120}{80 - 70} = \frac{40}{10} = 4$$

By the point slope form for the equation of a line

$C - C_0 = m(T - T_0)$ where the point (T_0, C_0) represents any

$$C(T) = C_0 + m(T - T_0) = 120 + 4(T - 70)$$

$$\boxed{C(T) = 4T - 160}$$

- If the temperature is changed by 1°F , the number of chirps per minute changes by four.
- The crickets chirp more frequently as temperature increases

Problem 5

a) The number of students who enroll is directly proportional to the number of students admitted. If x denotes the number of students offered admission, then the number of students who actually enroll (y) is given by

$$y = .55x$$

b) We want to know how many students to offer admission to if we want a class of 1100 students. So x is the unknown. So

$$1100 = .55x \Rightarrow x = \frac{1100}{.55} = 2000$$

Problem 6

$$2x - 4y - 8 = 0$$

$$2x - 8 = 4y$$

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

two lines are parallel if they have the same slope. We want our line to be parallel to the line $2x - 4y - 8 = 0$ which can be rewritten as

$$y = \frac{x}{2} - 2. \text{ So we want our line}$$

to have a slope of $\frac{1}{2}$. By the point slope form for the equation of a line

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

$$y = 2 + \frac{1}{2}(x + 2)$$

$$y = \frac{1}{2}x + 3$$