

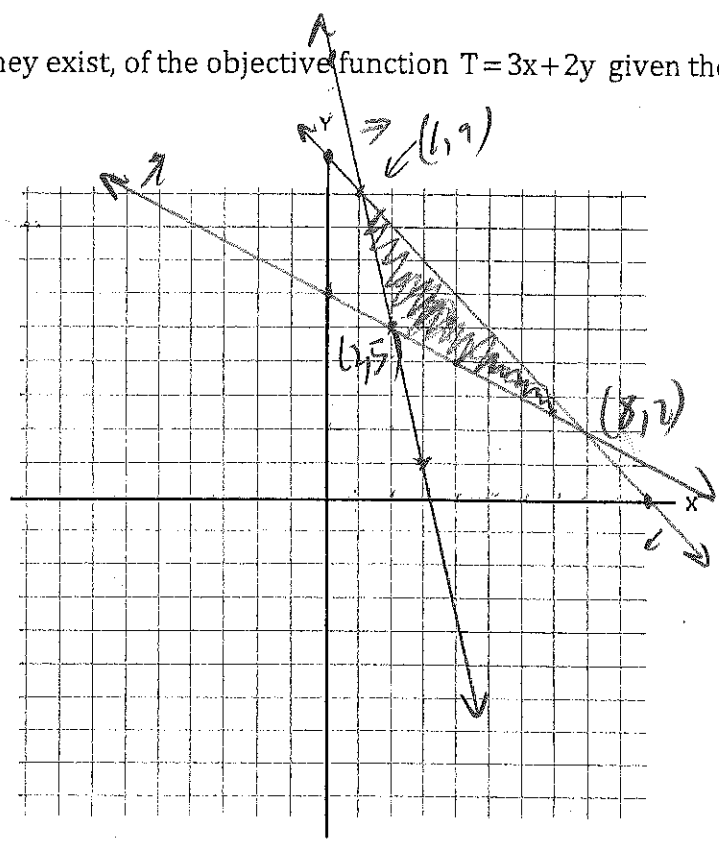
Pre-Calculus CP 1 – Section 7.6 HW  
 Linear Programming Day 1 Homework

Name: KEY

1. Find the maximum and minimum values, if they exist, of the objective function  $T = 3x + 2y$  given the set of constraints below.

$$\begin{cases} x + y \leq 10 & y \leq -x + 10 \\ x + 2y \geq 12 & y \geq -\frac{1}{2}x + 6 \\ 4x + y \geq 13 & y \geq -4x + 13 \end{cases}$$

$0 \leq x \leq 10$



min value of 16 at (2, 5)

max value of 28 at (8, 2)

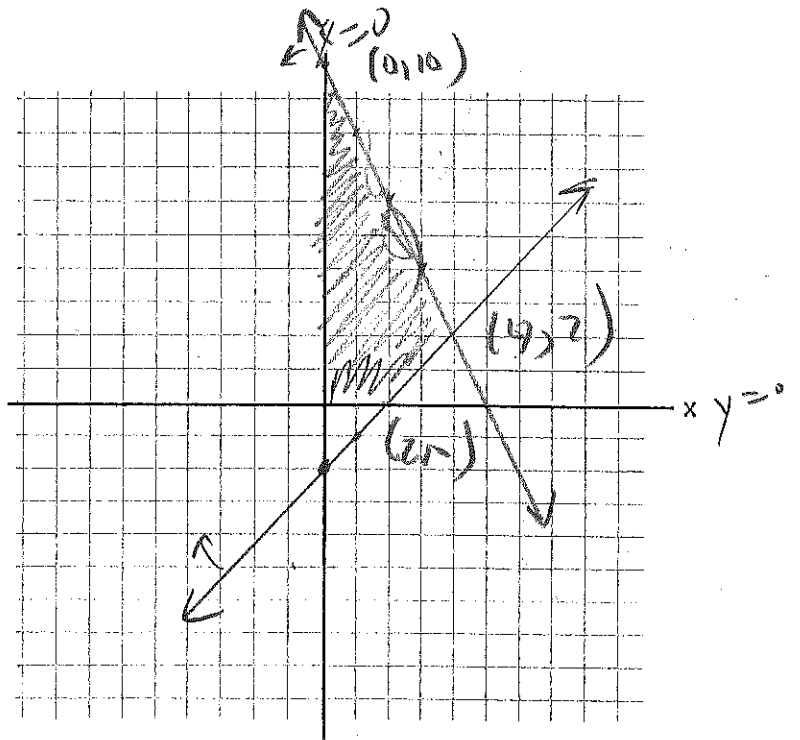
$$3(8) + 2(2) = 28$$

$$3(2) + 2(5) = 16$$

$$3(1) + 2(9) = 21$$

2. Find the maximum and minimum values, if they exist, of the objective function  $P = x + 5y$  given the set of constraints below.

$$\begin{cases} 2x + y \leq 10 & y \leq -2x + 10 \\ x - y \leq 2 & y \geq x - 2 \\ x \geq 0 \\ y \geq 0 \end{cases}$$



min value of 0 at (0, 0)

max value of 50 at (0, 10)

$$P(0, 0) = 0 + 5(0) = 0$$

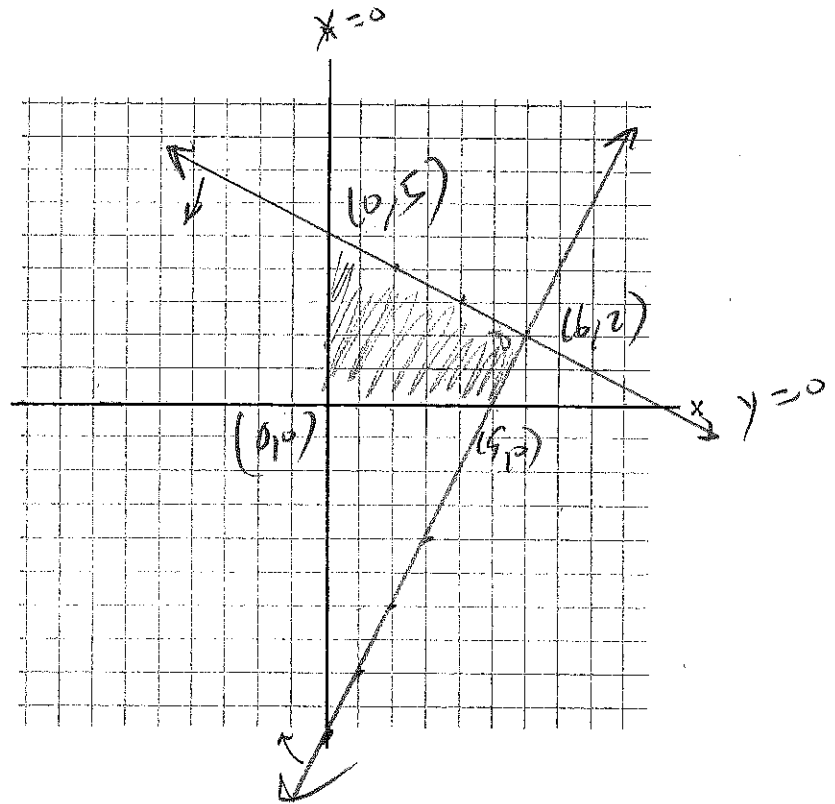
$$P(0, 10) = 0 + 5(10) = 50$$

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3. Find the maximum and minimum values, if they exist, of the objective function  $F = 12x - 5y$  given the set of constraints below.

$$\begin{cases} 2x - y \leq 10 & y \geq 2x - 10 \\ x + 2y \leq 10 & y \leq -\frac{1}{2}x + 5 \\ x \geq 0 \\ y \geq 0 \end{cases}$$



min value of 0 at (0,0)

max value of 62 at (6,2)

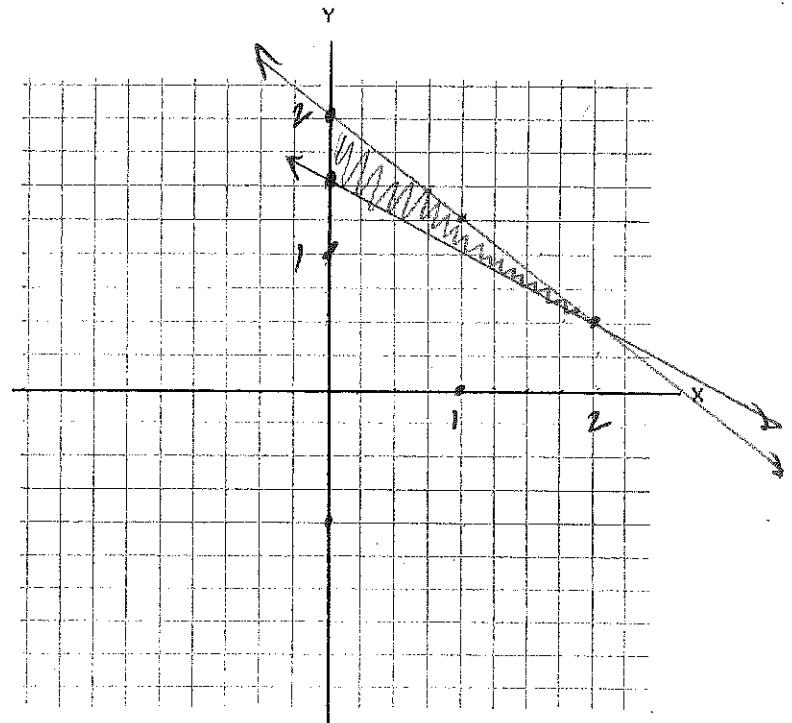
$$P(0,0) = 0 - 0 = 0$$

$$P(6,2) = 12(6) - 5(2) = 62$$

$$P(5,0) = 12(5) - 0 = 60$$

4. Graph and find the **vertices** of the feasible region (there will be fractions).

$$\begin{cases} x + 2y \geq 3 & y \geq -\frac{1}{2}x + \frac{3}{2} \\ 3x + 4y \leq 8 & y \leq -\frac{3}{4}x + 2 \\ x \geq 0 \\ y \geq 0 \end{cases}$$



vertices: (0, 3/2)  
(0, 2)  
(2, 1/2)