

4.5 Linear Programming

Shade Region

Corner Points

Objective Function

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$$\left. \begin{array}{l} x \geq 0 \\ y \geq 0 \end{array} \right\} \text{Quadrant I}$$

$$x + y \leq 6 \quad 0 + 0 \leq 6 \quad \text{True}$$

$$y = -x + 6$$

Corner Points

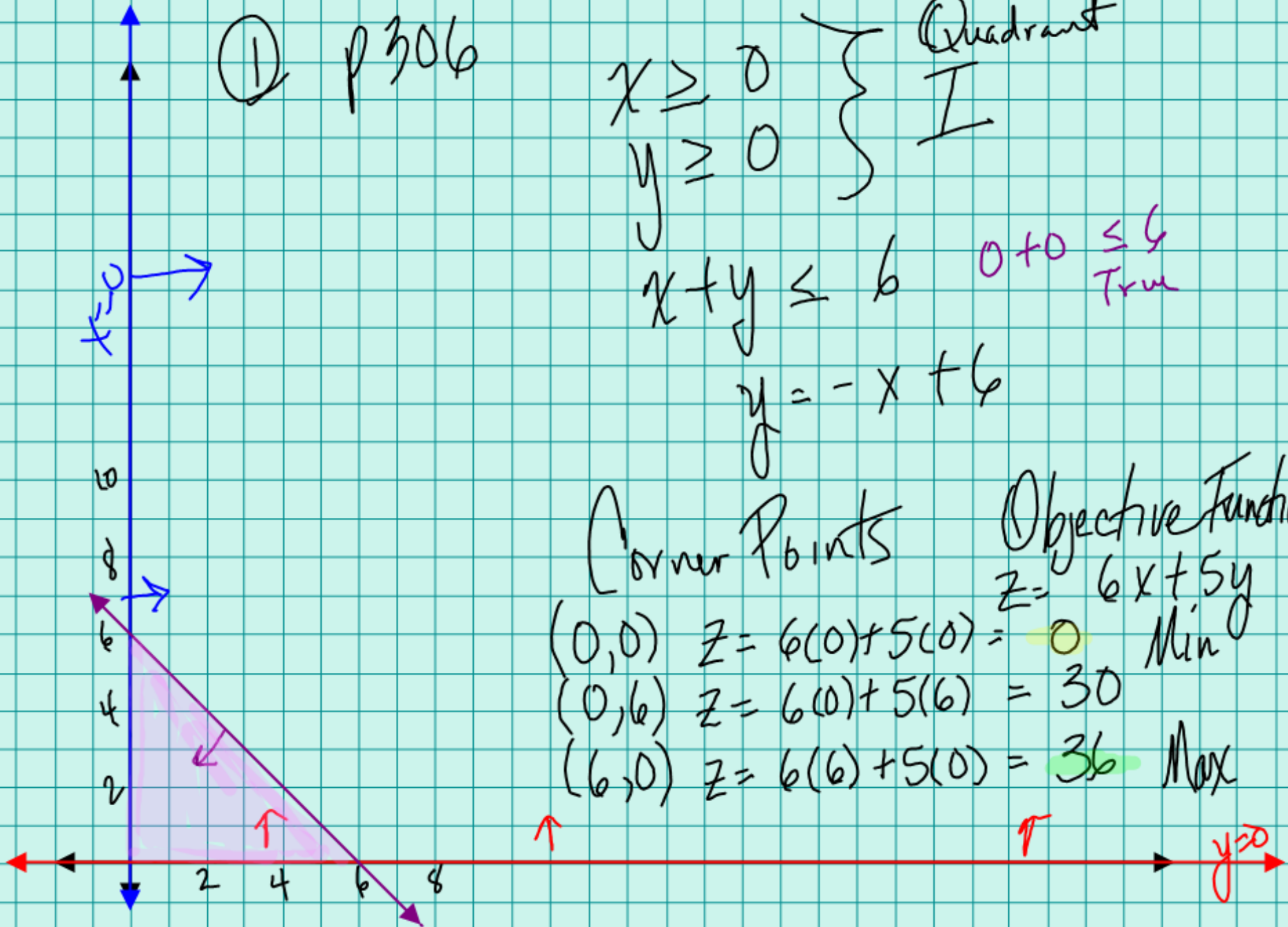
Objective Function

$$Z = 6x + 5y$$

$$(0,0) \quad Z = 6(0) + 5(0) = 0 \quad \text{Min}$$

$$(0,6) \quad Z = 6(0) + 5(6) = 30$$

$$(6,0) \quad Z = 6(6) + 5(0) = 36 \quad \text{Max}$$



Prob  
21

$$3x + y \leq 15$$

$$4x + 3y \leq 30$$

$$x \geq 0$$

$$y \geq 0$$

$$y = -3x + 15$$

$$y = -\frac{4}{3}x + 10$$

$$Z = 2x + y$$

$$(0, 0) \quad Z = 2(0) + 0 = 0$$

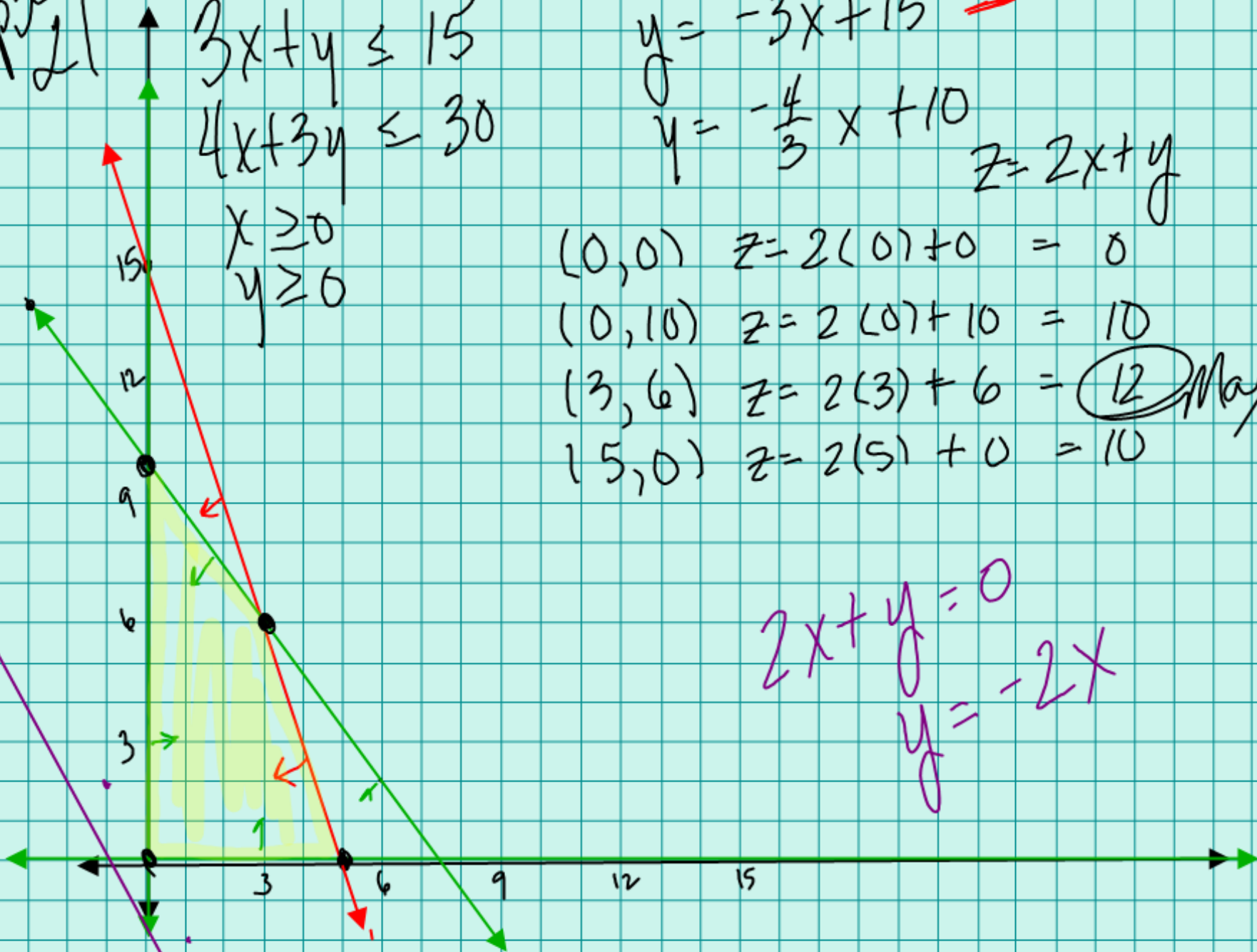
$$(0, 10) \quad Z = 2(0) + 10 = 10$$

$$(3, 6) \quad Z = 2(3) + 6 = \mathbf{12} \text{ Max}$$

$$(5, 0) \quad Z = 2(5) + 0 = 10$$

$$2x + y = 0$$

$$y = -2x$$



33. Maximize Profit

$x$  Crop A  
 $y$  Crop B

Objective Function

$$P = 185x + 245y$$

Constraints

$$x \geq 0$$

$$y \geq 0$$

$$x + y \leq 150$$

$$x + 2y \leq 240$$

$$\frac{3}{10}x + \frac{1}{10}y \leq 30$$

Graph  
Corner Points