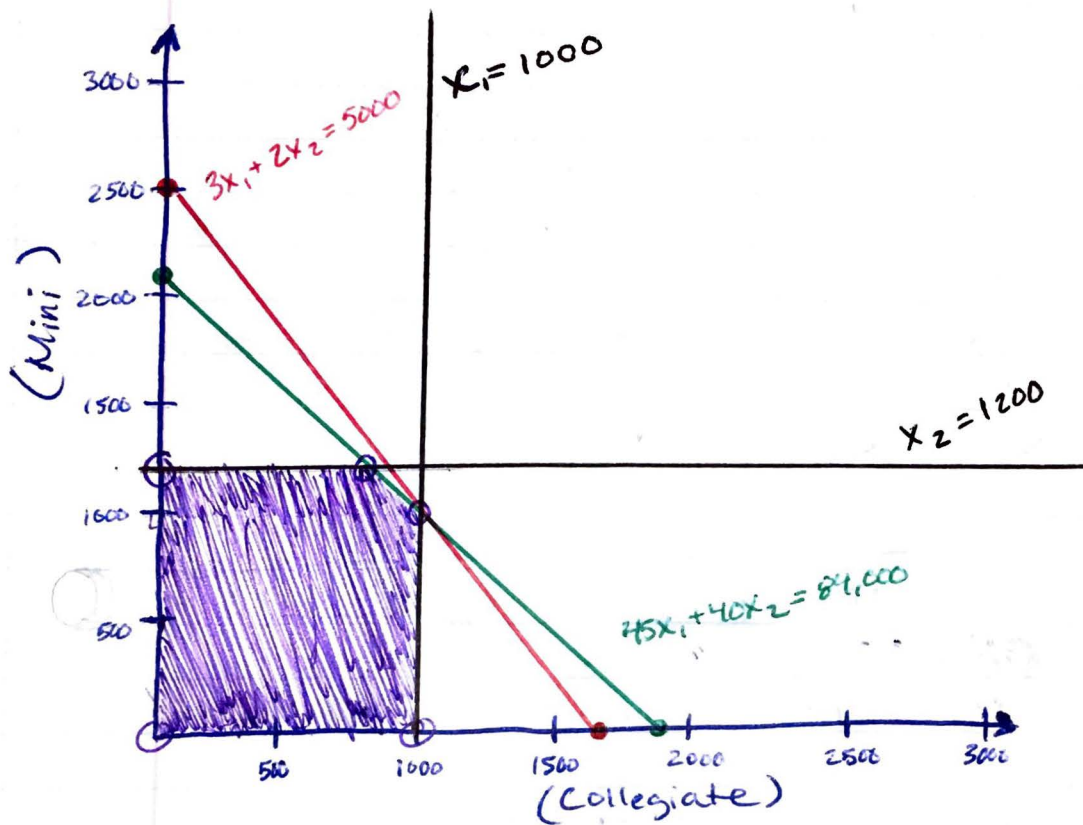


Assignment 3

Gordon Wall

Back Savers



Let X_j = quantity of type (j) product to make per week.

$j=1 \rightarrow$ Collegiate $j=2 \rightarrow$ mini

$$\text{Max Profit (P)} = 32X_1 + 24X_2$$

• Constraint 1: $3X_1 + 2X_2 = 5000$

$X_1 = 0$; $3(0) + 2X_2 = 5000$

$X_2 = 2500$

$X_2 > 0$; $3X_1 + 2(0) = 5000$

$X_1 = 1666.67$

- Constraint 2: $X_1 = 1000$
- Constraint 3: $X_2 = 1200$
- Constraint 4: $45X_1 + 40X_2 = 84,000$
 $X_1 = 0; 45(0) + 40X_2 = 84,000$
 $X_2 = 2100$
 $X_2 = 0; 45X_1 + 40(0) = 84,000$
 $X_1 = 1866.67$
- Constraint 5: $X_1, X_2 \geq 0$

5 CPFS:

| | <u>OBS. F(x)</u> | <u>Profit(\$)</u> |
|--------------------|---|-------------------|
| 1) (0,0) | $EP = 32X_1 + 24X_2$ $P = 32(0) + 24(0) = 0$ | |
| 2) (0,1200) | $P = 32(0) + 24(1200) = 28,800$ | |
| 3) (1000,0) | $P = 32(1000) + 24(0) = 32,000$ | |
| 4) (1000, X_2) | $P = 32(1000) + 24(X_2) = ?$ intersects with constraint 4 and constraint 2 @ corner so: $45(1000) + 40X_2 = 84,000$ $45,000 + 40X_2 = 84,000$ $40X_2 = 39,000$ $X_2 = 975$ $P = 32(1000) + 24(975) = 55,400$ | |
| 5) (X_1 , 1200) | $P = 32(X_1) + 24(1200) = ?$ intersection of constraint 3 and 4 @ corner so: | |

turn

$$45(x_1) + 40(1200) = 84,000$$

$$45x_1 + 48,000 = 84,000$$

$$45x_1 = 36,000$$

$$x_1 = 800$$

$$P = 32(800) + 24(1200) = 54,400$$

Optimal Solution is corner point $(1000, 975)$,
or 1000 Collegiates and 975 Minis made
and yielding a \$ 55,400 profit.