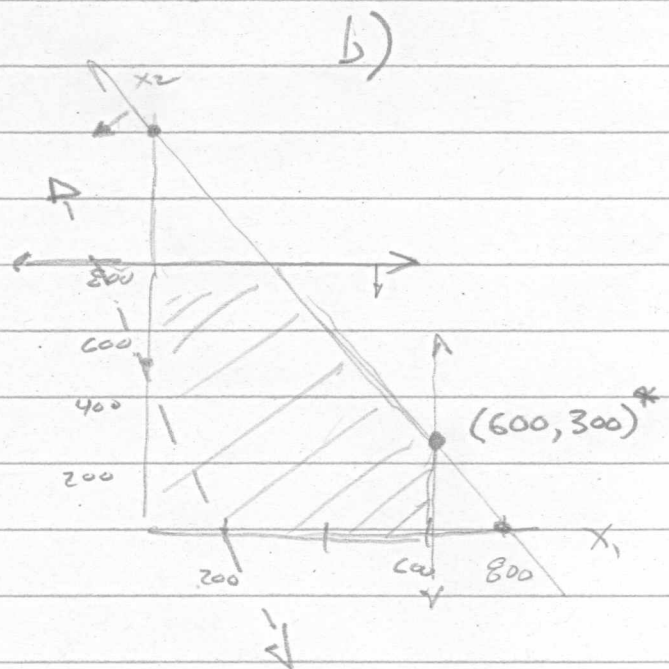


- 3.1-8 a) x_1 - units of insurance
 x_2 - units of mortgage

$$\begin{aligned} \text{MAX } & 5x_1 + 2x_2 \\ \text{s.t. } & 3x_1 + 2x_2 \leq 2400 \\ & 0x_1 + 1x_2 \leq 800 \\ & 2x_1 + 0x_2 \leq 1200 \\ & x_1, x_2 \geq 0 \end{aligned}$$



c) $x_1 = 600$

$$1800 + 2x_2 = 2400$$

$$x_2 = 300$$

$$Z = 5(600) + 2(300) = 3600$$

3-2.2 a) TRUE

b) TRUE

c) FALSE $Z = -x_1 - 2x_2$

3.2-3

 X_1 - amount invested in friend 1 as fraction X_2 - " " " " 2

b)

$$\text{Max } X_1 + X_2$$

$$\text{s.t. } 5000X_1 + 4000X_2 \leq 6000$$

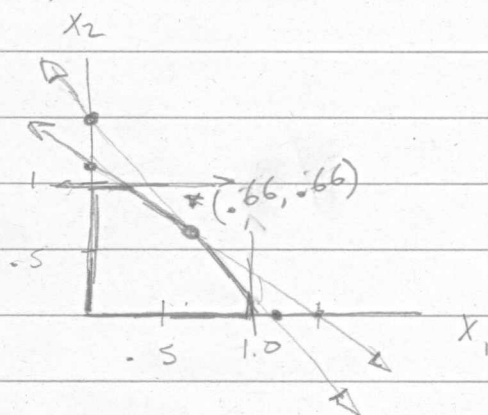
$$400X_1 + 500X_2 \leq 600$$

$$X_1 \leq 1$$

$$X_2 \leq 1$$

$$X_1, X_2 \geq 0$$

c)



$$5X_1 + 4X_2 = 4X_1 + 5X_2$$

$$X_1 = X_2$$

$$5X_1 + 4X_1 = 6$$

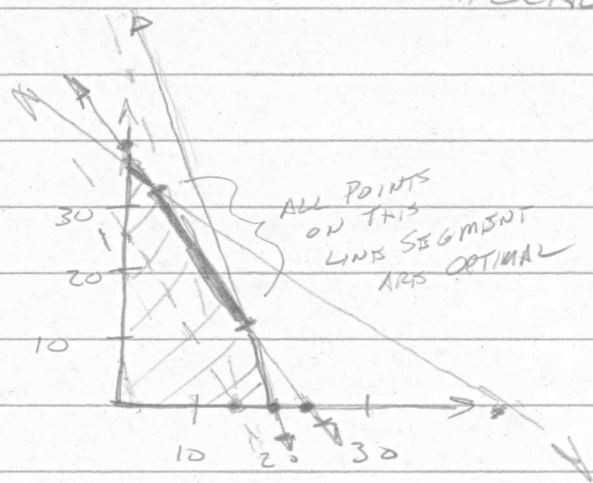
$$X_1 = \frac{6}{9}$$

$$Z = \frac{4}{3}(4,500)$$

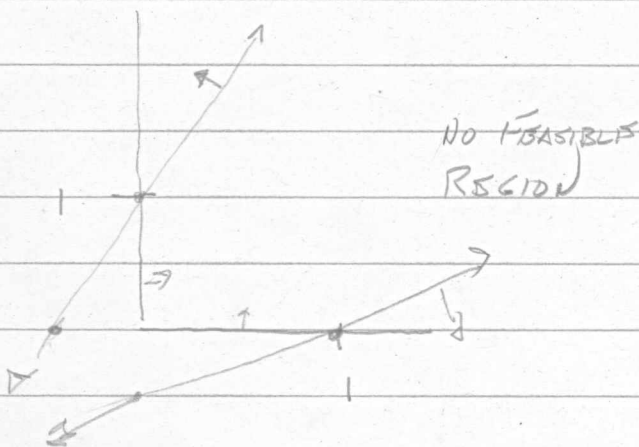
ETM 645
HW-1

SCOTT SCHULTE

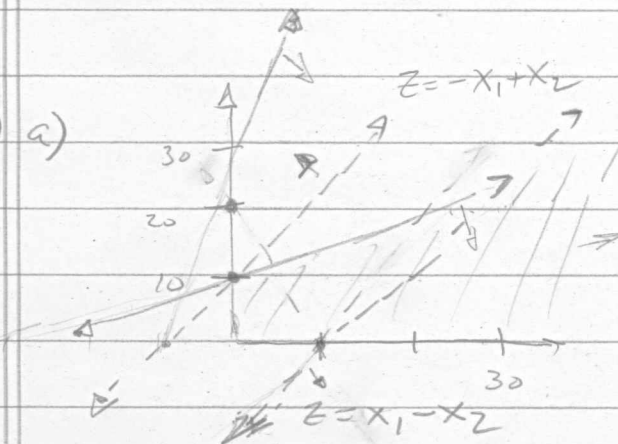
3.2-4) $Z = 500X_1 + 300X_2$
 s.t. $15X_1 + 5X_2 \leq 300$
 $70X_1 + 6X_2 \leq 240$
 $8X_1 + 12X_2 \leq 450$
 $X_1, X_2 \geq 0$



3.2-5)



3.2-6) a)



MAX
 b) $Z = -X_1 + X_2$
 $Z^* = 0 + 10 = 10$

MAX
 c) $Z = X_1 - X_2$
 $Z^* = \infty$

d) YES, GOOD SOLUTIONS, PROBABLY LEFT OUT CONSTRAINT BINDING UPPER END.

ETM 645
HW-1

Scott Schulte

3.4-9

X_{FM} - number fulltime in morning

X_{FA} - " " afternoon

X_{FE} - " " evening

X_{P1} - number part-time 8-Noon

X_{P2} - " " Noon-4pm

X_{P3} - " " 4pm-8pm

X_{P4} - " " 8pm-mid

$$\text{Min } 14(X_{FM} + X_{FA} + X_{FE}) + 12 \sum_{i=1}^4 X_{Pi}$$

S.t. $2X_{P1} \leq X_{FM}$

$2X_{P2} \leq X_{FM} + X_{FA}$

$2X_{P3} \leq X_{FA} + X_{FE}$

$2X_{P4} \leq X_{FE}$

$X_{P1} + X_{FM} \geq 4$

$X_{P2} + X_{FM} + X_{FA} \geq 8$

$X_{P3} + X_{FA} + X_{FE} \geq 10$

$X_{P4} + X_{FE} \geq 6$

$X_{Fi}, X_{Pi} \geq 0 \quad \forall i, j$

2 TIMES AS MANY FULL TIMERS

MIN MANPOWER

ETM 645
HW-#1

Scott Schuler

34-11 a) MAX R_6

$$\text{st } A_1 + B_1 + R_1 = 60,000$$

$$A_2 + B_2 + C_2 + R_2 = R_1$$

$$A_3 + B_3 + R_3 = R_2 + 1.4A_1$$

$$A_4 + B_4 + R_4 = R_3 + 1.4A_2 + 1.7B_1$$

$$A_5 + B_5 + D_5 + R_5 = R_4 + 1.4A_3 + 1.7B_2 + 1.9C_2$$

$$R_6 = R_5 + 1.4A_4 + 1.7B_3 + 1.9C_2 + 1.3D_5$$

$$A_i, B_i, C_i, D_i, R_i \geq 0$$