

An Introduction to Linear Programming

(Answers)

Problem 1

- $-1X_1 + 2X_2 - 1X_3 \leq 70$

This sloution is having an acceptable linear programming relationship

- $2X_1 - 2X_3 = 50$

This sloution is having an acceptable liner programming relationship

- $1X_1 - 2X_2^2 + 4X_3 \leq 10$

This sloution cannot be accepted because of $-2X_2^2$

- $^3\sqrt{X_1+2X_2-1X_3} \geq 15$

This sloution cannot be accepted because of $^3\sqrt{X_1}$

- $1X_1+1X_2+1X_3= 6$

This sloution is having an acceptable linear programming relationship

- $2X_1 + 5X_2 + X_1X_2 \leq 25$

This sloution cannot be accepted because of X_1X_2

Problem 17

a. R= no of units of regular model

P= no of units of professional model

Max $5R+8P$

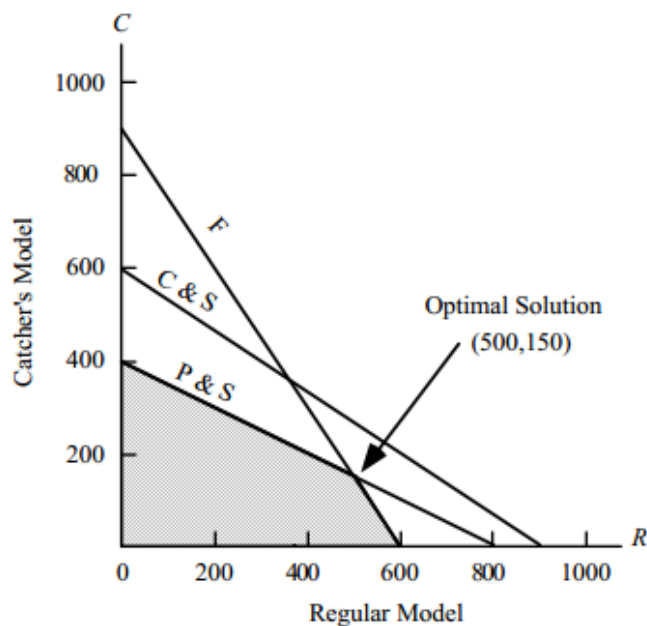
s.t $1 R+ 1.5 P \leq 900$ cutting and sewing

$0.5 R+0.333 P \leq 300$ finishing

$0.125 R+0.25 P \leq 100$ packing and shipping

$R,P \geq 0$

b. Graphical solution:



- c. $5(500) + 8(150) = \$3700$
d. C&S: $\$1(500) + 3/2(150) = 725$
F: $1/2(500) + 1/3(150) = 300$
P&S: $1/8(500) + 1/4(150) = 100$

e.

<i>department</i>	<i>Capacity</i>	<i>usage</i>	<i>slack</i>
C&S	900	725	175 hours
F	300	300	0 hours
P&S	100	100	0 hours

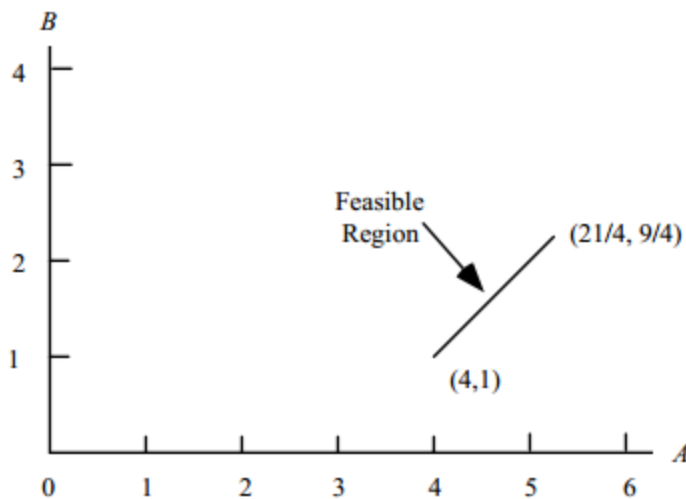
Problem 18

- a. Let B = percentage of funds invested in the bond fund
S = percentage of funds invested in the stock fund
Max $0.06B + 0.10S$
S.T $B \geq 0.3$ bond fund minimum
 $0.06B + 0.10S \geq 0.075$ minimum returns
 $B + S = 1$ percentage requirement
 $B, S \geq 0$

- b. Optimal solution $B = 0.3, S = 0.7$
The value of optimal solution is 0.08 (8.8%)

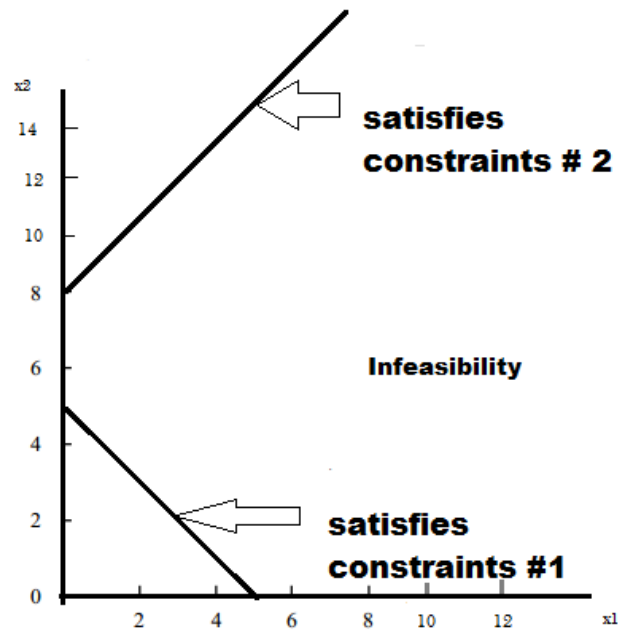
Problem 24

a.



- b) There are two extreme points $(x_1 = 4, x_2 = 1)$ and $(x_1 = 21/4, x_2 = 9/4)$
c) The optimal solution is $x_1 = 4, x_2 = 1$

Problem 32



Problem 33

