

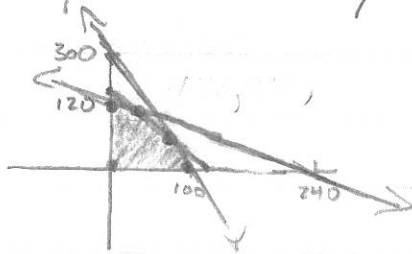
10.8A Solutions - Linear Programming

- 1.) $x = \#$ of acres of apples
 $y = \#$ of acres of peaches

$$x + y \leq 150 \rightarrow y \leq -x + 150$$

$$x + 2y \leq 240 \rightarrow y \leq -\frac{1}{2}x + 120$$

$$.3x + .1y \leq 30 \rightarrow y \leq -3x + 300$$



$$P = 140x + 235y \quad (\text{Maximize})$$

Feasible Points

$$(0,0), (0,120), (75,75), (100,0), + (60,90)$$

$$P = 140(0) + 235(0) = 0$$

$$P = 140(0) + 235(120) = \$28,200$$

$$P = 140(75) + 235(75) = \$28,125$$

$$P = 140(100) + 235(0) = \$14,000$$

$$P = 140(60) + 235(90) = \$29,550$$

60 acres of apples and
 90 acres of peaches
 yields max profit of
 \$29,550

- 2.) $x = \#$ of bags of brand X
 $y = \#$ of bags of brand Y

$$2x + y \geq 12 \quad \text{protein}$$

$$2x + 9y \geq 36 \quad \text{carbs}$$

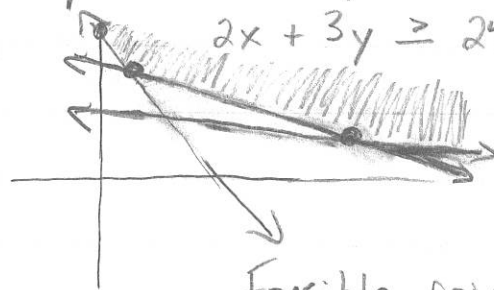
$$2x + 3y \geq 24 \quad \text{fat}$$

$$C = 25x + 20y$$

$$y \geq -2x + 12$$

$$y \geq -\frac{2}{9}x + 4$$

$$y \geq -\frac{2}{3}x + 8$$



Feasible points

$$(0,12), (3,6), (9,2)$$

<over>

#2 Continued

$$C = 25(0) + 20(12) = \$240$$

$$C = 25(3) + 20(6) = \$195$$

$$C = 25(9) + 20(2) = \$265$$

3 bags of brand x and
6 bags of brand y
yield a minimum
cost of \$195

3.) $.30x + .60y \leq 1000$

$$.70x + .40y \leq 1500$$

$$x \geq 0, y \geq 0$$

x = liters of 1st drink

y = liters of 2nd drink

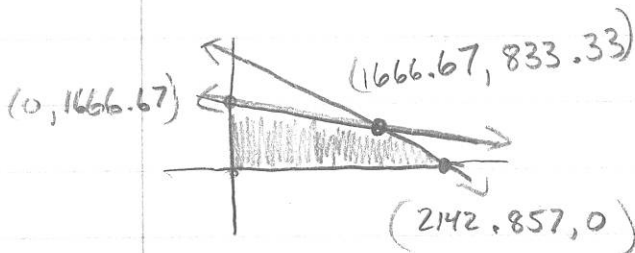
OJ

Pineapple juice

$$P = .6x + .5y$$

$$y \leq -\frac{1}{2}x + 1666.67$$

$$y \leq -\frac{7}{4}x + 3750$$



Feasible points

$$(0, 1666.67), (1666.67, 833.33),$$

$$(2142.857, 0), (0, 0)$$

$$P = .6(0) + .5(1666.67) = \$833.34$$

$$P = .6(1666.67) + .5(833.33) = \$1416.67$$

$$P = .6(2142.857) + .5(0) = \$1285.71$$

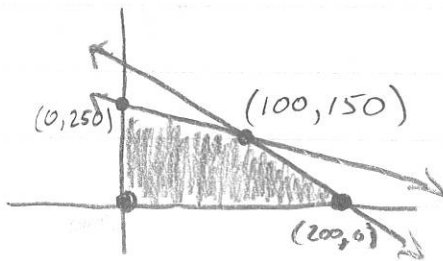
$$P = .6(0) + .5(0) = 0$$

1666.67 liters
of 1st drink +
833.33 liters of
2nd drink yields A
MAX profit of
\$1416.67

4.) $x =$ Acres of corn
 $y =$ Acres of beans

$$y \leq -x + 250$$

$$y \leq \frac{-3}{2}x + 300$$



$$x + y \leq 250 \quad x \geq 0$$
$$\frac{x}{10} + \frac{y}{15} \leq 20 \quad y \geq 0$$

$$P = 30x + 25y$$

Feasible points

$$(0, 250), (0, 0), (200, 0)$$

$$(100, 150)$$

$$P = 30(0) + 25(250) = \$6,250$$

$$P = 30(0) + 25(0) = \$0$$

$$P = 30(200) + 25(0) = \$6,000$$

$$P = 30(100) + 25(150) = \$6,750$$

100 acres of corn and 150 acres of beans yields
a max profit of \$6,750

