Section 2.2

(33)

1) Variables

Let x = # of hockey games

y = # of soccer games

2) Chart

	(x) Hockey	(y) Soccer	Available
Assembly (Hours)	2	3	42
Testing (Hours)	2	1	26

3) Inequalities

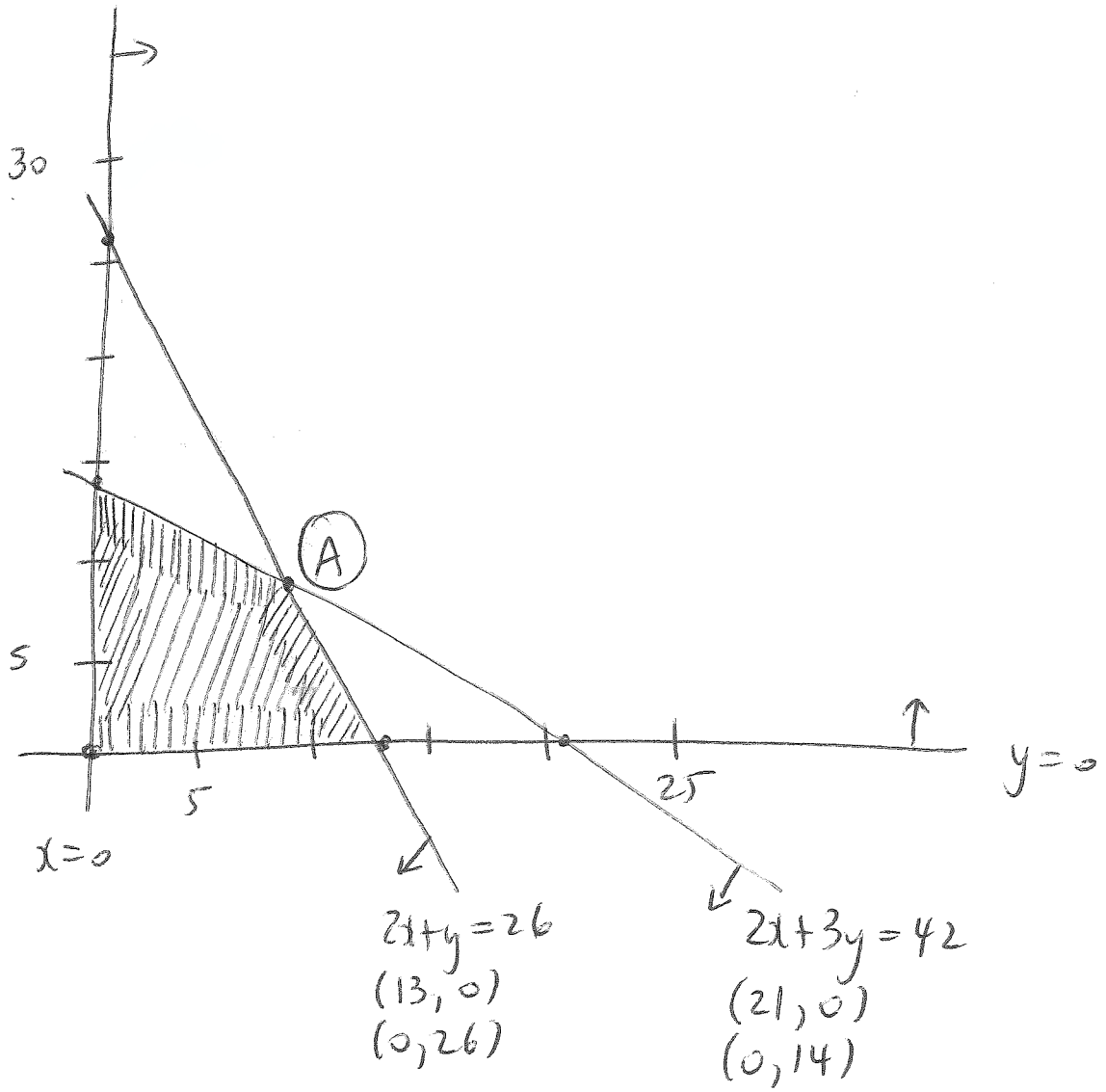
Assembly: $2x + 3y \leq 42$

Testing: $2x + y \leq 26$

Non-negative: $x \geq 0, \quad y \geq 0$

4) Graph Feasible Set

Section 2.2 #33



Section 2.2 #33

5) Find all vertices

3 can be found from the graph:

(0,0), (0,14), (13,0)

A:

$2x+y=26$

$y=26-2x$

$2x+3y=42$

$3y=42-2x$

$y=14-\frac{2}{3}x$

$y=y$

$26-2x=14-\frac{2}{3}x$

Multiply by 3: $78-6x=42-2x$

$36=4x$

$9=x$

$x=9 \rightarrow$ $2x+y=26$

$18+y=26$

$y=8$

$A=(9,8)$

6) objective Function

Maximize (total output)

↖ total # of games produced

$=x+y$

Maximize $x+y$

Section 2.2 #33

7) Table

Vertices	Total Output = $x+y$
$(0,0)$	0
$(0,14)$	14
$(13,0)$	13
$(9,8)$	17

8) Answer

The maximum total output is 17 games, by making 9 hockey games and 8 soccer games.

Section 2.2 #47

1) Variables

Let x = # of Pamper Me baskets
y = # of Best Friends baskets

2) Chart

	(x) Pamper Me	(y) Best Friends	Available
Shower Gel	1	2	400
Bubble Bath	2	2	550
Candles	2	0	400
Profit ($)	15	12	

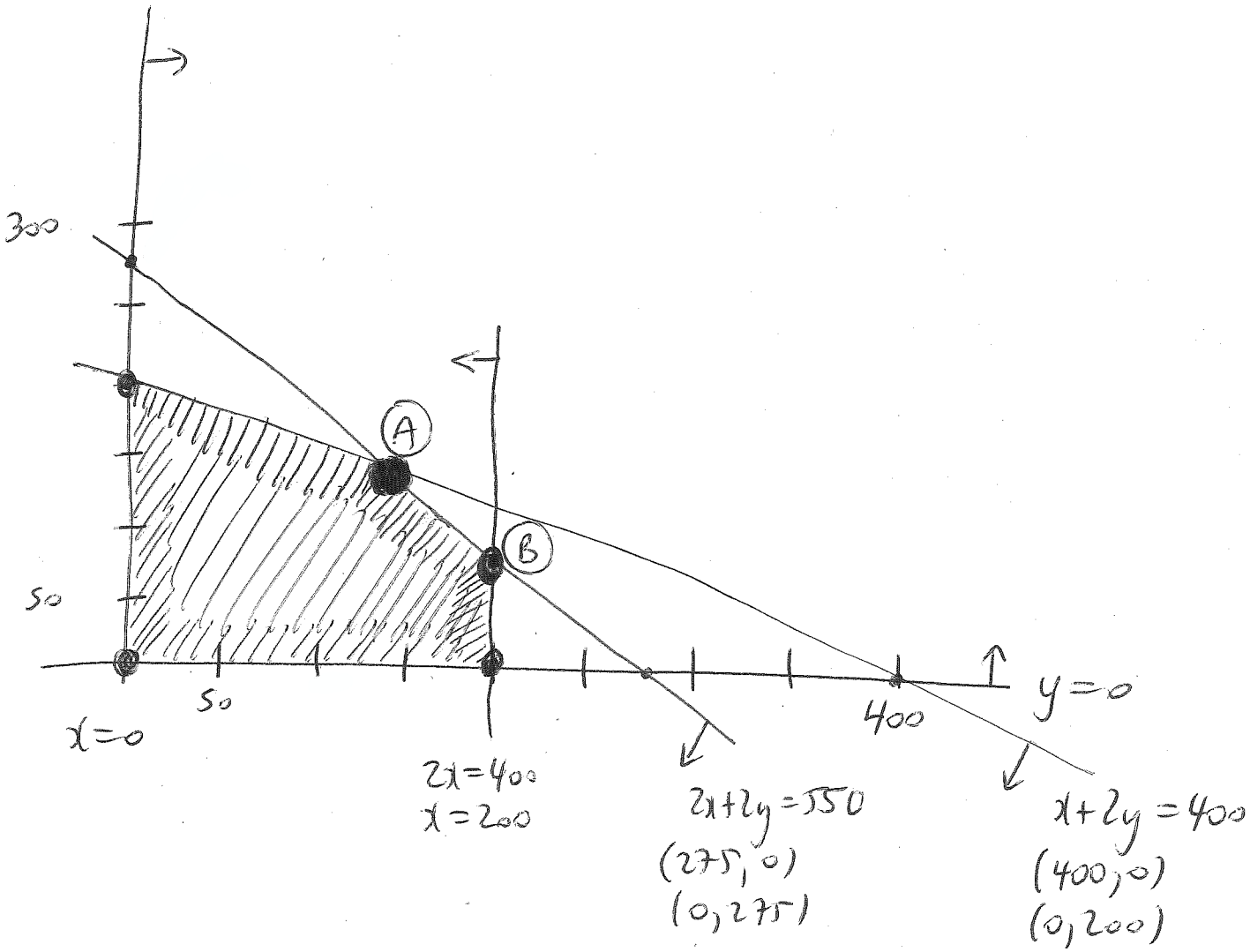
3) Inequalities

$$x + 2y \leq 400$$
$$2x + 2y \leq 550$$
$$2x \leq 400$$

Non-negative: $x \geq 0$, $y \geq 0$

Section 2.2 #47

4) Graph Feasible Set



5) Find All vertices

3 can be found from the graph:

(0,0), (0,200), (200,0)

→

Section 2.2 #47

Finding All Vertices Cont'd

Vertex A:

$x + 2y = 400$

$2y = 400 - x$

$y = 200 - \frac{x}{2}$

$2x + 2y = 550$

$2y = 550 - 2x$

$y = 275 - x$

$y = y$

$200 - \frac{x}{2} = 275 - x$

Multiply by 2: $400 - x = 550 - 2x$

$x = 150$

$x = 150 \rightarrow \quad x + 2y = 400$

$150 + 2y = 400$

$2y = 250$

$y = 125$

$A = (150, 125)$

Vertex B:

$$\begin{cases} x = 200 \\ 2x + 2y = 550 \end{cases}$$

$x = 200 \rightarrow \quad 2x + 2y = 550$

$400 + 2y = 550$

$2y = 150$

$y = 75$

$B = (200, 75)$

Section 2.2 #47

6) Objective Function

Maximize profit ($)

$15x + 12y$

7) Table

Vertices	Profit = $15x + 12y$
(0,0)	0
(0,200)	2400
(200,0)	3000
(150,125)	3750
(200,75)	3900

8) Answer

The maximum profit is $3900, by making 200 Pamper Me baskets and 75 Best Friends baskets.

Section 2.1 #7

Joe's Confectionary puts together two prepackaged assortments. Assortment A contains 2 candy bars and 2 suckers and yields a profit of 40¢. Assortment B contains 1 candy bar and 2 suckers and yields a profit of 30¢. The store has available 500 candy bars and 600 suckers.

How many packages of Assortment A and B yield the maximum profit?

1) Variables

Let x = # of packages of Assortment A
y = " " " B

2) Chart

	A (x)	B (y)	Available
Candy Bars	2	1	500
Suckers	2	2	600
Profit ($)	0.40	0.30	

Section 2.1 #7

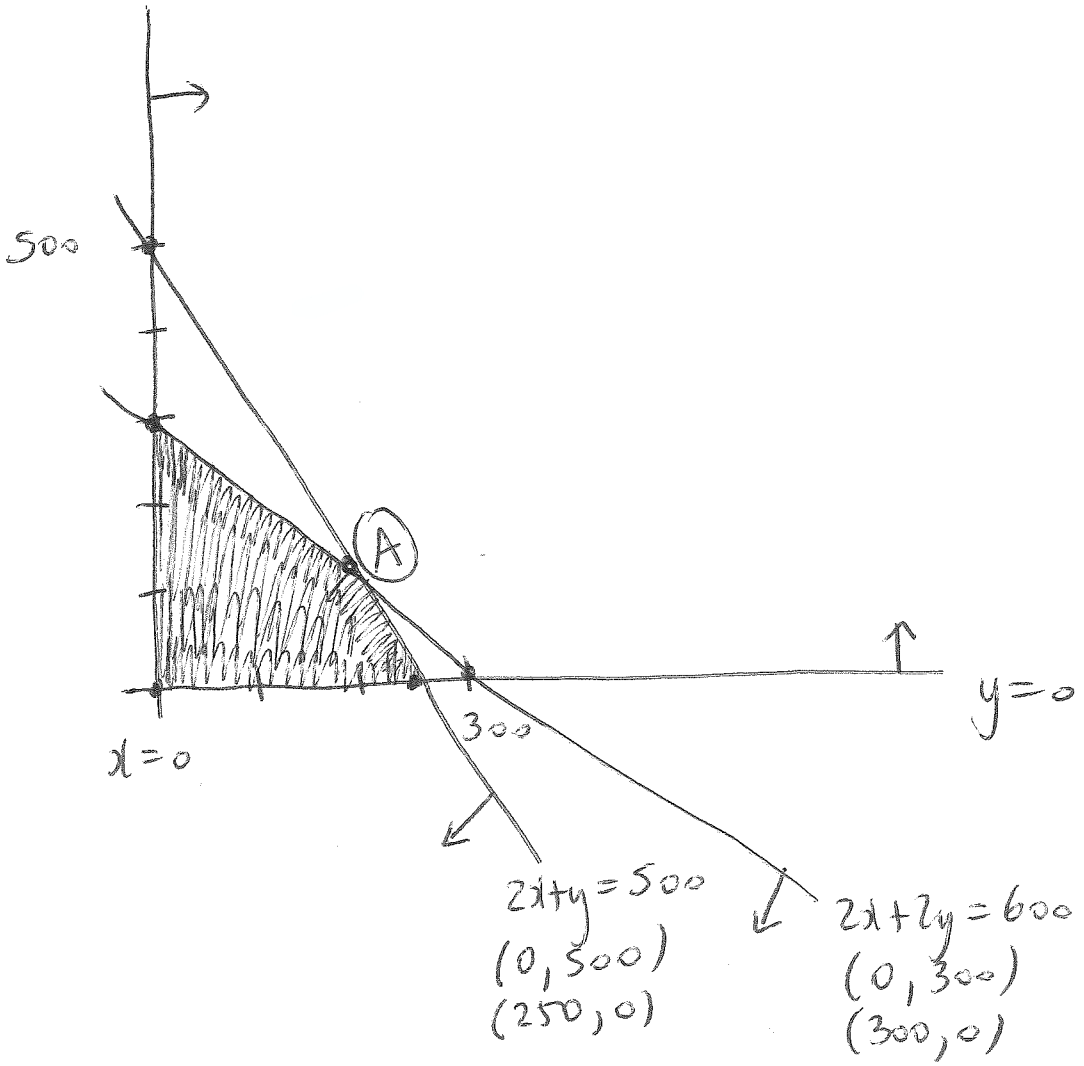
3) Inequalities

Candy Bars: $2x + y \leq 500$

Suckers: $2x + 2y \leq 600$

Non-negative: $x \geq 0,\ y \geq 0$

4) Graph Feasible Set



Section 2.1 #7

5) Find all vertices

3 can be found from the graph:

(0,0), (0,300), (250,0)

A: $2x+y=500$ | $2x+2y=600$

$y=500-2x$ | $2y=600-2x$

$y=300-x$

$y=y$

$500-2x=300-x$

$200=x$

$200=x \rightarrow 2x+y=500$

$400+y=500$

$y=100$

$A=(200,100)$

6) objective Function

Maximize profit ($)

$0.40x+0.30y$

7) Table

Vertices	Profit = $0.40x + 0.30y$
$(0, 0)$	0
$(0, 300)$	90
$(250, 0)$	100
$(200, 100)$	110

8) Answer

The maximum profit is $110, by making 200 packages of Assortment A and 100 packages of Assortment B.