

HW16 - 7.1, 7.3

7.1) Maximize  $Sx + 3y$

$$Sx - 2y \geq 0$$

$$x + y \leq 7$$

$$x \leq 5$$

$$x \geq 0$$

$$y \geq 0$$

$$x \leq 7 - y$$

$$y \leq 7 - x$$

$$Sx \geq 2y$$

$(2, 5), (5, 2)$  Border values

$$\text{Max } Sx + 3y$$

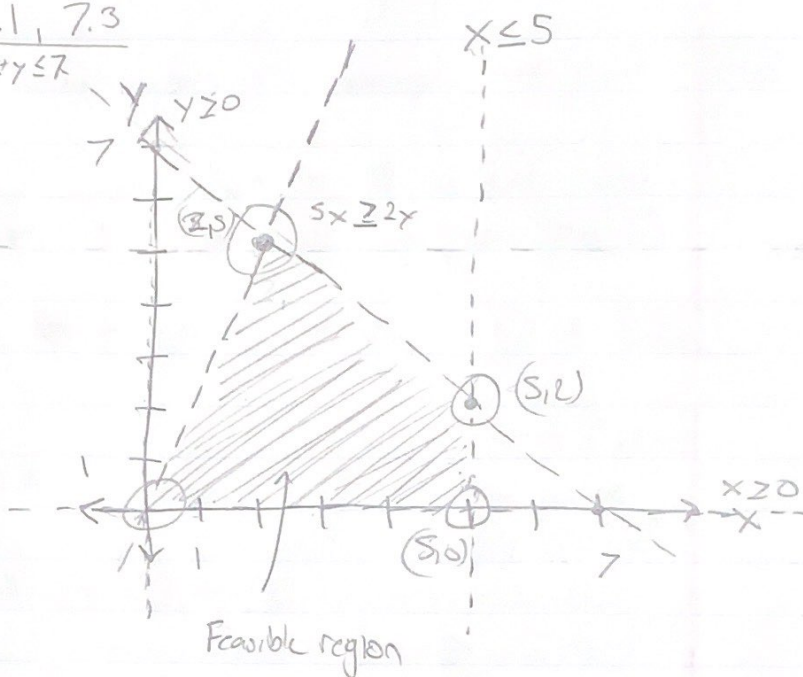
$$(0, 0) = S(0) + 3(0) = 0$$

$$(5, 0) = S(5) + 3(0) = 25$$

$$(5, 2) = S(5) + 3(2) = 31$$

$$(2, 5) = S(2) + 3(5) = 25$$

$$\Rightarrow Sx + 3y \text{ is maxed at } x=5, y=2$$



7.3) Cargo plane carries max 100 tons, max volume 60 cubic meters.

$x_1$ : Material 1 = 2 tons, 40 cubic meters available \$1,000/cubic meter

$x_2$ : Material 2 = 1 ton, 30 is max available, \$1,200/cubic meter

$x_3$ : Material 3 = 3 ton/cubic meter max available = 20 cubic meter, \$12,000/cubic meter

$$\text{Maximize } 1,000x_1 + 1,200x_2 + 12,000x_3$$

$$x_1 \geq 0$$

$$x_2 \geq 0$$

$$x_3 \geq 0$$

$$2x_1 + x_2 + 3x_3 \leq 100$$

$$x_1 \leq 40$$

$$x_2 \leq 30$$

$$x_3 \leq 20$$

$$x_1 + x_2 + x_3 \leq 60$$

Max (from solver)

$$x_1 = 5$$

$$x_2 = 30$$

$$x_3 = 20$$