

← For #30,

- a) Give the constraints and objective function
- b) Give the simplex tableau
- c) Stop!

$$2x_1 + 3x_2 + 2x_3 \leq 30000$$

$$x_1 + 2x_2 + 2x_3 \leq 38000$$

$$2x_1 + 3x_2 + x_3 \leq 28000$$

$$2x_1 + 5x_2 + 4x_3 = z$$

Let x_1 be the grams of soybean meal
" x_2 " " meat by-products
" x_3 " " grain

$$2.5x_1 + 4.5x_2 + 5x_3 \geq 54$$

$$5x_1 + 3x_2 + 10x_3 \geq 60$$

$$C = .08x_1 + .09x_2 + .10x_3$$

$$\begin{bmatrix} 2.5 & 4.5 & 5 & 54 \\ 5 & 3 & 10 & 60 \\ .08 & .09 & .10 & 1 \end{bmatrix} \Rightarrow \begin{bmatrix} 2.5 & 5 & .08 \\ 4.5 & 3 & .09 \\ 5 & 10 & .10 \\ 54 & 60 & 1 \end{bmatrix}$$

$$2.5x_1 + 5x_2 \leq .08$$

$$4.5x_1 + 3x_2 \leq .09$$

$$5x_1 + 10x_2 \leq .10$$

$$z = 54x_1 + 60x_2$$

$$R(x) = -x^2 + 8x \quad C(x) = 2x + 5$$

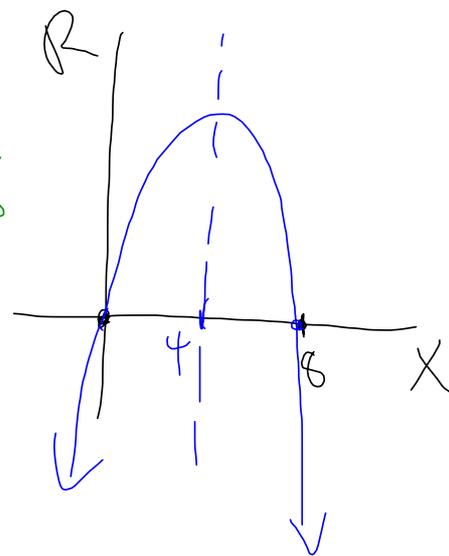
* What is max revenue, and for what value of x does it occur?

$$x = \frac{-8}{2(-1)} = 4 \quad R(4) = -4^2 + 8(4) = 16$$

The max revenue is 16 at $x=4$.

$$R(x) = x(-x + 8)$$

$R = 0$ when $x = 0$ or 8



Due Wed

4.2: ^{8th} 29 / ^{9th} 31

- a) define vars
- b) constraints + obj function
- c) tableau

4.3: 16/19

- a) as above
- b) as above

c) dual problem

$$\text{If } ax^2 + bx + c = 0,$$

$$\text{then } x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$