A farmer wants to plant some acres of soybeans and wheat this season.

- The farmer has up to 240 acres of land to use for these crops. $S+W \leq 240$
- The farmer has only enough seed for at most 180 acres of wheat. $W \leq 180$

Define variables and write four inequalities to model the constraints in this situation.

S = # acres of Soybean		W = # acres of Wheat	
$S \geq 0$	$W \geq 0$	$S + W \leq 240$	$W \leq 180$

S = # acres of Soybean

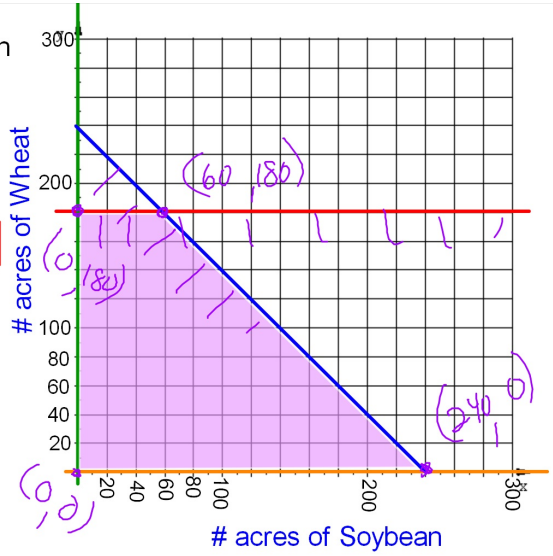
W = # acres of Wheat

$S \geq 0$ $W \geq 0$

$S + W \leq 240$ $W \leq 180$

S-int = 240

W-int = 240



Suppose that the farmer can sell the Soybeans for $150 an acre and the Wheat for $200 and acre.

How many acres of each should be planted in order to maximize the income?

Write an equation for income: $I = 150S + 200W$

The Corner-Point Principle:
Any maximum or minimum value of a linear combination of variables will occur at one of the vertices of the feasible region (shaded region).

See next panel for results

Income Equation: $I = 150S + 200W$

S	W	150S + 200W
0	0	$0
0	180	$36,000
60	180	$45,000
240	0	$36,000

The farmer should plant 60 acres of Soybean and 180 acres of Wheat to maximize income.