Example: Appliance Store has a capacity of 50 items
(washers/dryers)

   Washers: 2 hrs to unpack/set up, sell for $300
   Dryers : 1 hr to unpack/set up, sell for $200
   Have 80 hrs of employee time to set up.

How many washers/dryers should we set up to
max revenue?

x = # washers

y = # dryers

$x + y \leq 50$ $x \geq 0$
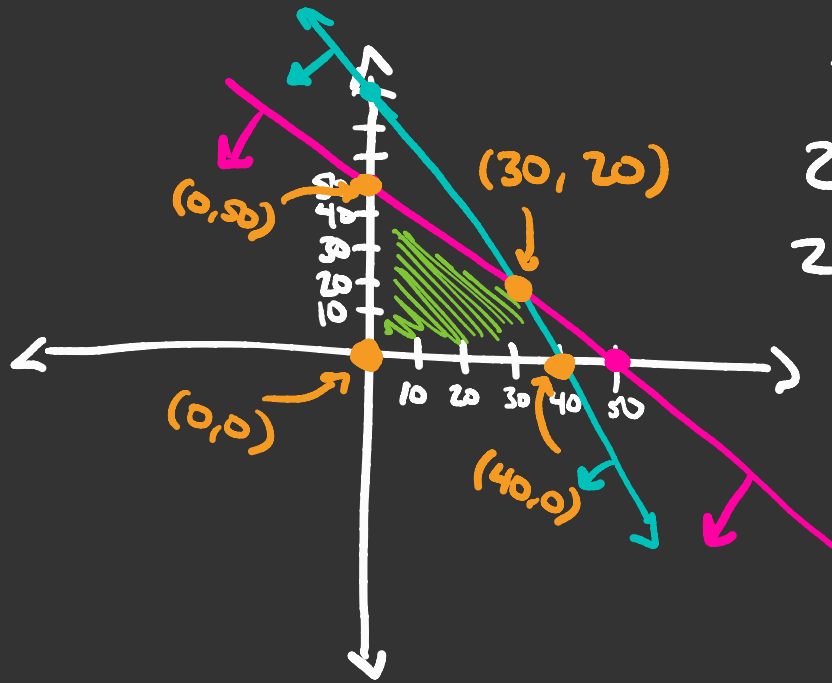
$2x + y \leq 80$ $y \geq 0$

$\underbrace{}_{\text{Constraints}}$ $\underbrace{}_{\text{Nonnegativity}}$

$x+y \leq 50$

$2x+y \leq 80$

$x+y=50 \rightsquigarrow y=50-x$

$2x+y=80$

$2x+(50-x)=80$

$x+50=80$

$x=30$

(0,50)

(30, 20)

(0,0)

10 20 30 40 50

(40,0)

Revenue $= z = 300x + 200y$

Objective function

Key Fact: Given a linear objective function w/ linear constraints, if the objective function has a max/min, it <u>must</u> occur at a corner of the feasible region.

If feasible region bounded, objective function has max and min

$(0,0): Z = 300(0) + 200(0) = 0$ Min

$(0,50): Z = 300(0) + 200(50) = 10000$

$(40,0): Z = 300(40) + 200(0) = 12000$

$(30,20): Z = 300(30) + 200(20) = 9000 + 4000 = 15000$

Max