Optimal Solutions

Goal:

- to find the optimal solution to a problem
- to correctly identify which vertices represent optimal solutions

Jane is selling apparel. She sells hats (y) and shirts (x). Shirts sell for $20 and hats sell for $25.

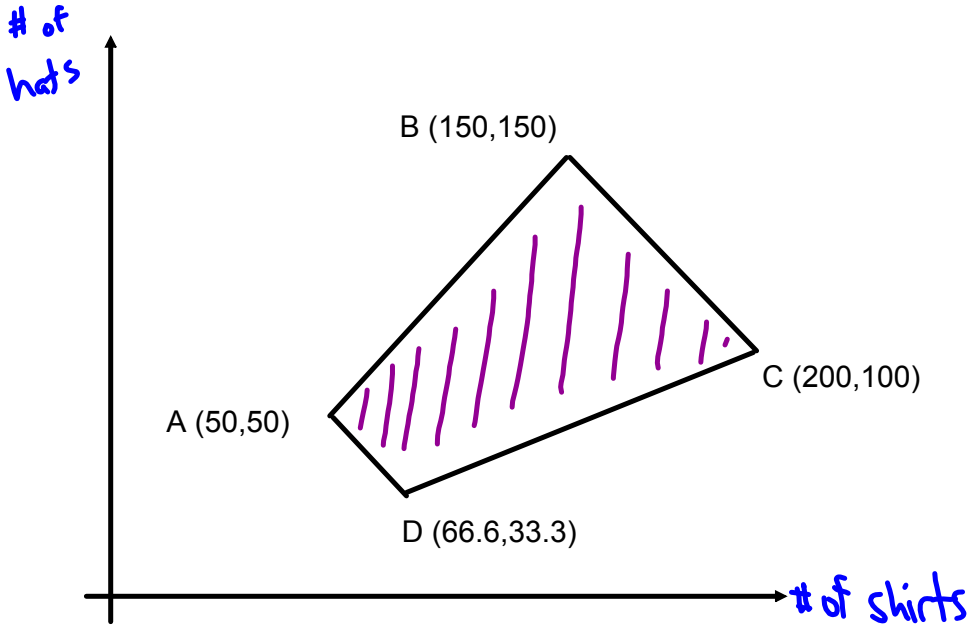
How many hats and shirts does Jane want to sell?

As many as she can!

Objective is to maximize revenues.

$R = 20x + 25y$ ⇐ Target rule (objective rule)

Below is the polygon of constraints for Jane's situation:



How many shirts and hats does Jane want to sell?

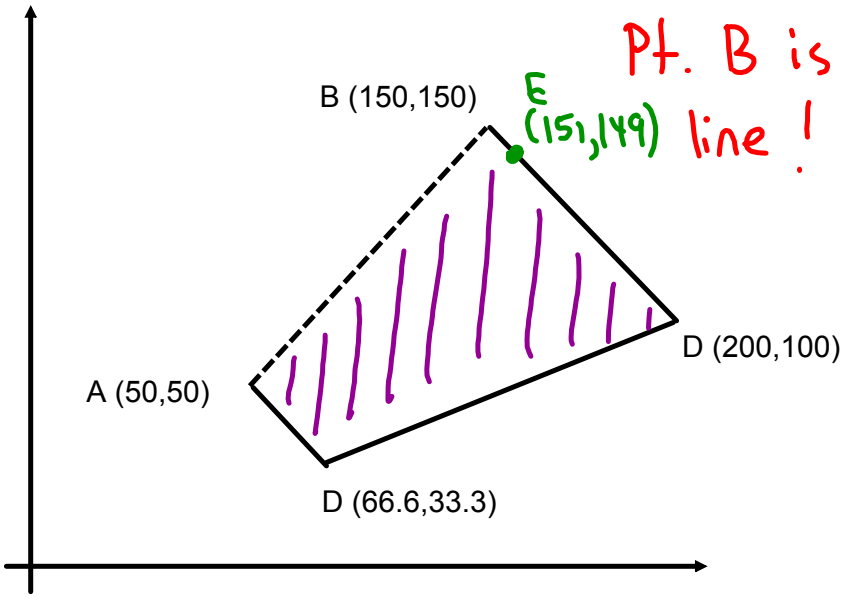
$R = 20x + 25y$

Pt. B : $R = 20(150) + 25(150) = \$6750$ ⇐ Max.

Pt. C : $R = 20(200) + 25(100) = \$6500$

She should try to sell 150 shirts and 150 hats for a revenue of $6750.

What if the polygon of constraints looked like this:



Pt. B is on broken line! Cannot be used.

How many shirts and hats does Jane want to sell?

Since pt. B cannot be used test points near B but on polygon of constraints:

E(151,149)

$R = 20(151) + 25(149) = \$6745$

To find the optimal solution:

- find the rule that describes the objective/goal

- test each vertex on the polygon of constraints to find the min or max

- remember that vertices on broken lines cannot be used