

11-9-05

①

Shirley Knotts raises cats & dogs for profit

She gets 90 lbs fish waste
120 lbs meat scraps
54 vitamins
each week

Each cat eats ~~2~~ 1 lb meat scraps,
2 lbs fish waste, 1 vitamin each week.

Each dog eats 3 lbs meat scraps
1 lb fish waste, 1 vitamin each week

Each cat ^{earns her} ~~sells~~ \$100; each dog \$125

Mrs Knotts needs to make a choice about how many cats/dogs to make as much money as possible.

P₂₀ If she raises 27 cats, 27 dogs

$$\text{Profit} = \$6075 = 27^c \cdot 100^{\$/c} + 27^d \cdot 125^{\$/d}$$

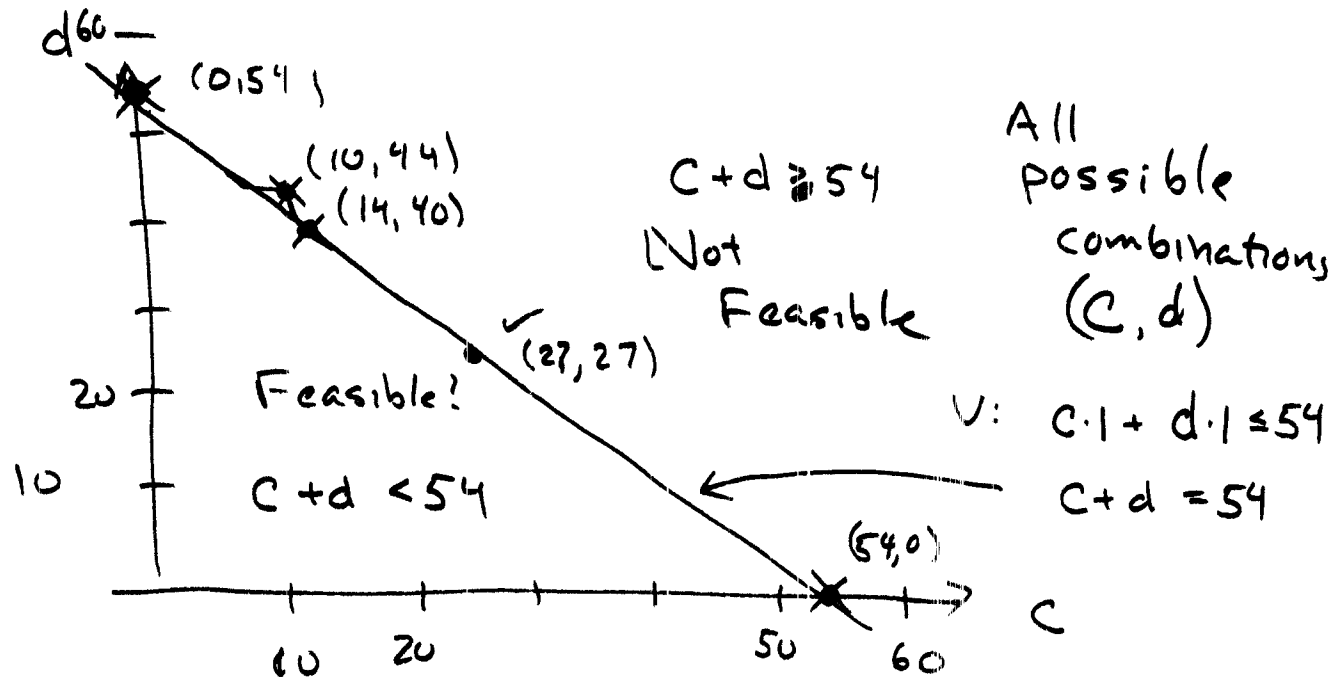
$$\text{Vit used} = 54 v = 27^c \cdot 1^{v/c} + 27^d \cdot 1^{v/d}$$

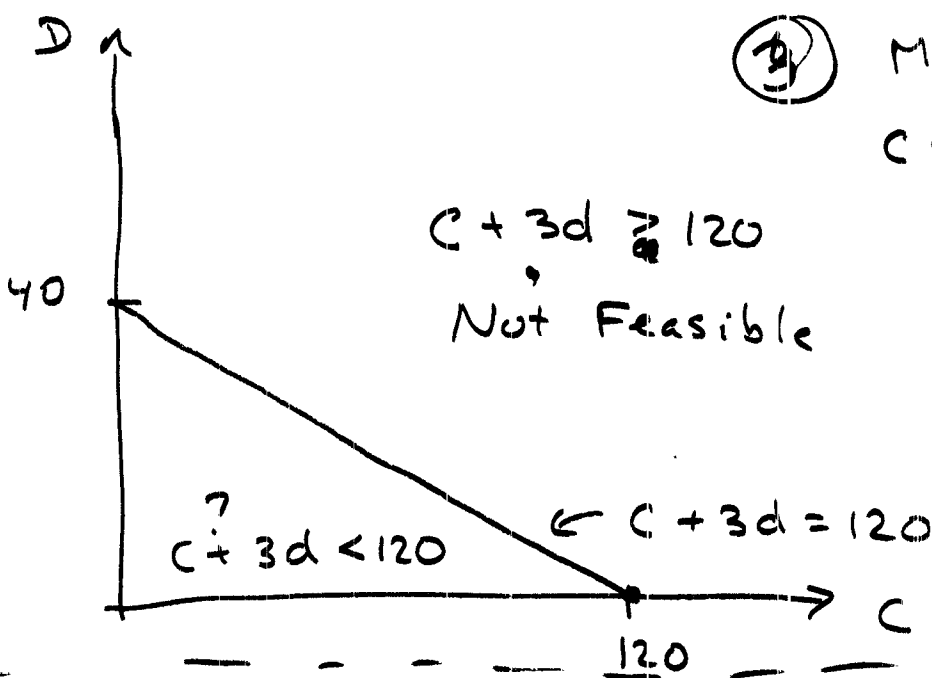
$$\text{fish used} = 81 \text{ lbs} = 27^c \cdot 2^{lb/c} + 27^d \cdot 1^{lb/d}$$

$$\text{meat used} = 108 \text{ lbs} = 27^c \cdot 1^{lb/c} + 27^d \cdot 3^{lb/d}$$

	c	d	≤ 54	≤ 90	≤ 120	(2)
			V	FU	MIS	P
	27	27	54	81	108	6075
*	54	0	54	108	54	5400 X
*	0	54	54	54	162	6750
*	14	40	54	68	134	5140
*	10	44	54	54	142	6500

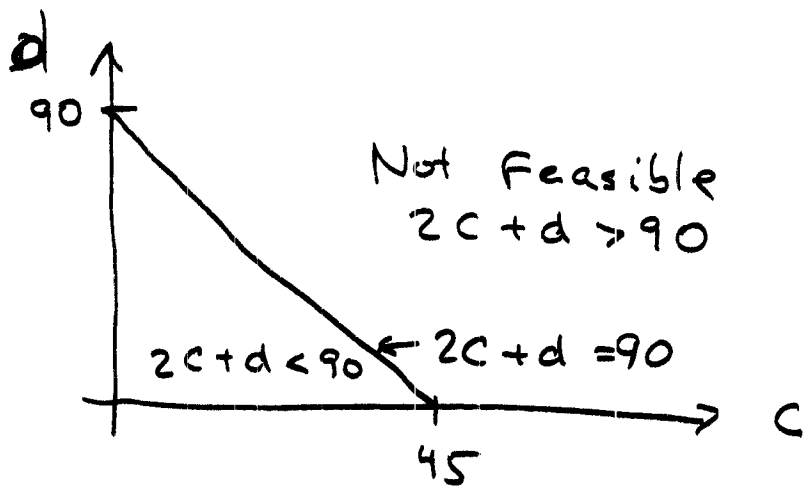
Linear Programming - Identify all feasible combinations of (cats, dogs) & then choose the best of those to optimize Mrs. Knott's Profit.





② Meat - ~~Plan~~ Use all
 $c \cdot 1 + d \cdot 3 = 120$
 line

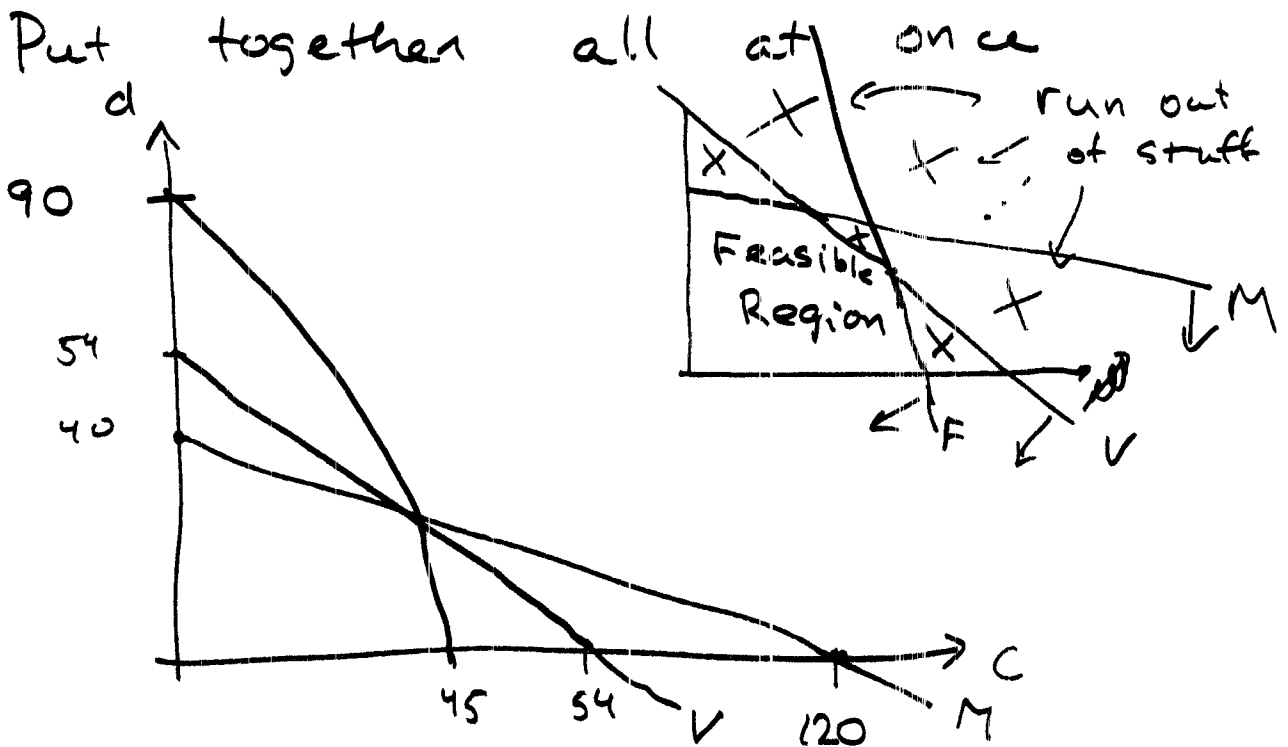
c	d
0	$d = \frac{120}{3} = 40$
120	0

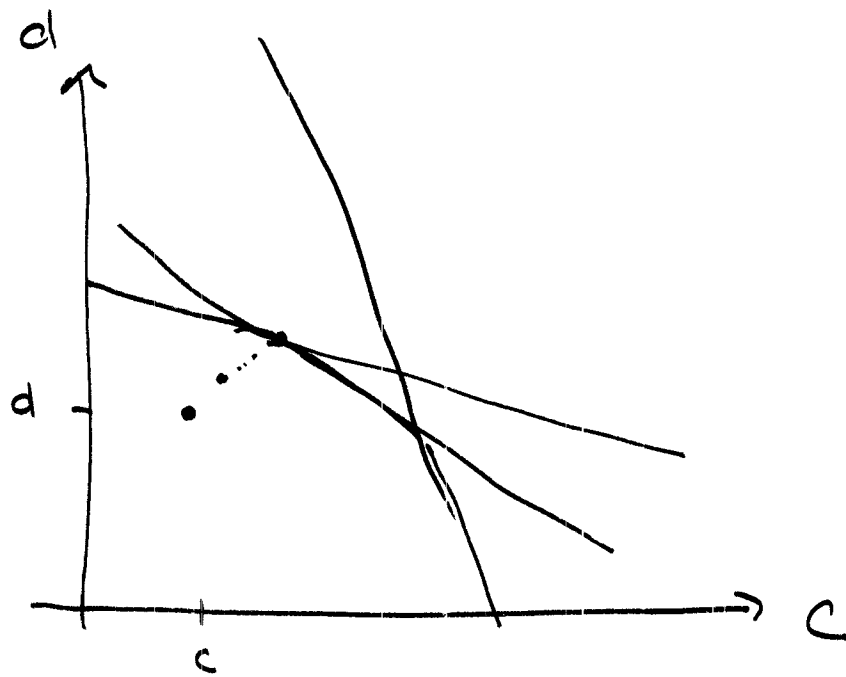


Fresh
 $c \cdot 2 + d \cdot 1 = 90$

c	d
0	90
45	0

Should look like P 196





~~Step~~ Theorem about Solving Linear Programming Problems.

- ① Instead of considering all possible combinations, just look at feasible points
- ② Instead of considering all possible feasible points, just look at points on boundary of feasible region.
- ③ Instead of all boundary points, just consider corner points of feasible region.