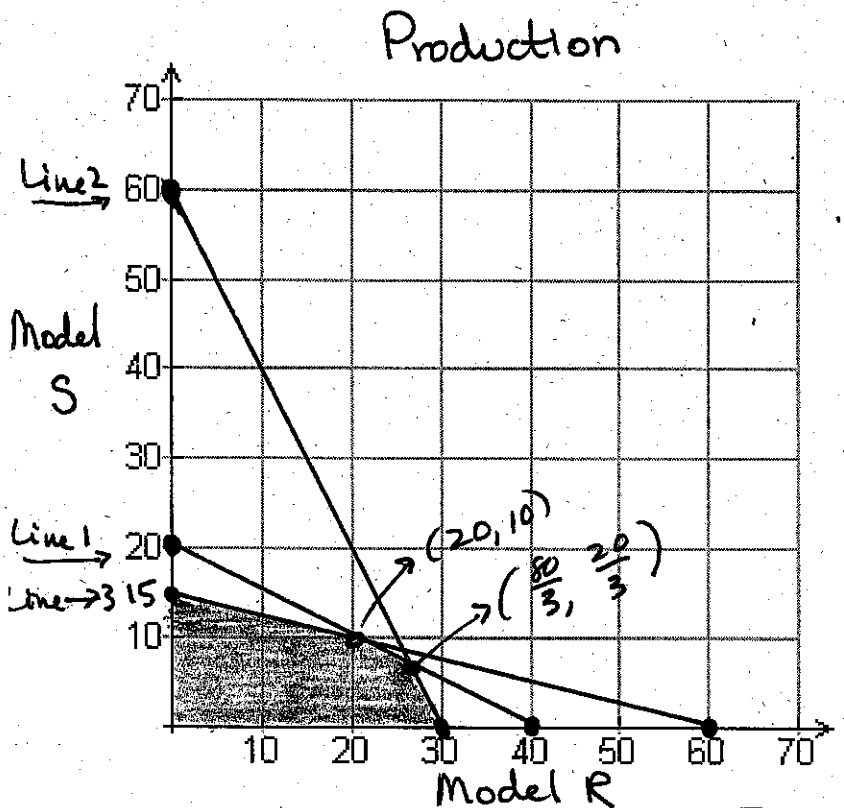
1. A company makes two kinds of tires; model R (regular) and model S (snow). Each tire is processed on three machines, A, B and D. To make one model R requires ½ hour on machine A, 2 hours on B, and 1 hour on C. To make one model S requires 1 hour on A, 1 hour on B, and 4 hours on C. During the next week machine A will be available for at most 20 hours, machine B for at most 60 hours, and machine C for at most 60 hours. If the company makes a $10 profit on each model R tire and a $15 profit on each model S tire, about how many of each tire should be made to maximize the company's profit?



R = model R

S = model S

$*P = 10R + 15S$

(0,15)	225
(20,10)	350
$*\left(\frac{80}{3}, \frac{20}{3}\right)$	$366\frac{2}{3}$
(30,0)	300

	A	B	C
Model R	$\frac{1}{2}$	2	1
Model S	1	1	4
	≤ 20	≤ 60	≤ 60

Line 1 $\frac{1}{2}R + S \le 20$

Line 2 $2R + S \le 60$

Line 3 $1R + 4S \le 60$

Intersection Lines 1 & 3

$$\begin{bmatrix} \frac{1}{2} & 1 \\ 1 & 4 \end{bmatrix}\begin{bmatrix} R \\ S \end{bmatrix} = \begin{bmatrix} 20 \\ 60 \end{bmatrix}$$

$$[A]^{-1}[A]\begin{bmatrix} R \\ S \end{bmatrix} = [A]^{-1}[B]$$

$$\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}\begin{bmatrix} R \\ S \end{bmatrix} = \begin{bmatrix} 20 \\ 10 \end{bmatrix}$$

Intersection Lines 1 & 2

$$\begin{bmatrix} \frac{1}{2} & 1 \\ 2 & 1 \end{bmatrix}\begin{bmatrix} R \\ S \end{bmatrix} = \begin{bmatrix} 20 \\ 60 \end{bmatrix}$$

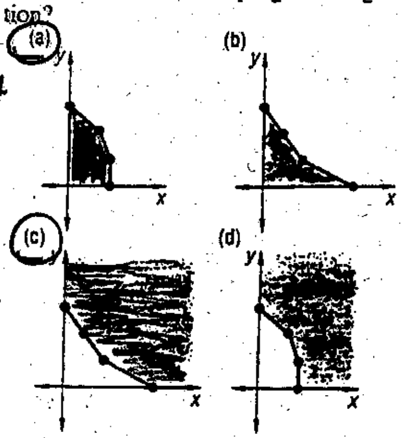
$$[A]^{-1}[A]\begin{bmatrix} R \\ S \end{bmatrix} = [A]^{-1}[B]$$

$$\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}\begin{bmatrix} R \\ S \end{bmatrix} = \begin{bmatrix} \frac{80}{3} \\ \frac{20}{3} \end{bmatrix}$$

2. Which two of the following could be feasible regions in a linear-programming situation?

max

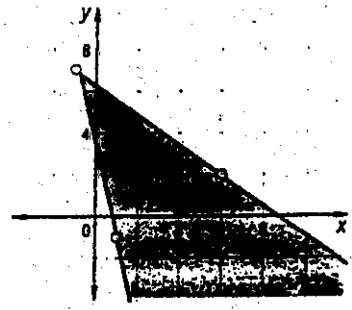
min



3. A system of inequalities was graphed as shown below. Are the coordinates listed below possible solutions to the system? Justify your answers.

a. (3, 2) yes

b. (6, 2) no



4. Where in a feasible set are the possible solutions to a linear-programming problem?

vertices