QMM

1. Given,

	S_2	Profit	Time
Collegiate	3	32 $	45
mini	2	24 $	40

35 labours ⟶ 40hrs

a) Decision Variables

collegiate ⟶ x_c
mini ⟶ x_m

b) Objective function

Max [Profit] $Z = 32x_c + 24x_m$

c) Constraints : $45x_c + 40x_m \leq (35)(40)(60)$

Material Constraints : $3x_c + 2x_m \leq 5000$

Non Negativity

$x_c, x_m \geq 0$

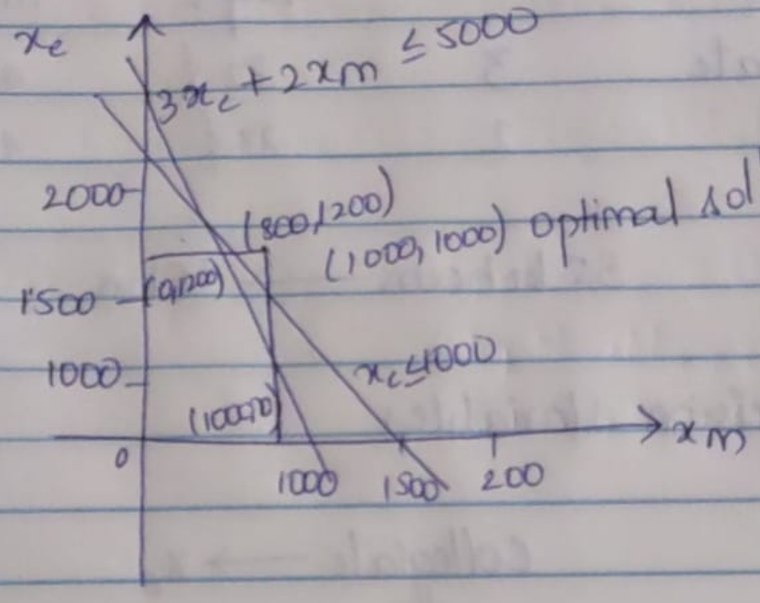
$x_c \leq 1000$

$x_m \leq 1200$

d) $Z = 32x_c + 24x_m$

$45x_c + 40x_m \leq (35)(40)(60)$

$3x_c + 2x_m \leq 5000$



Corner points are

(0,0) (1000,0) (0,1200) (800,1200) (1000,1000)

Objective function

$Z = 32x_c + 24x_m$

(0,0) $\longrightarrow$ Z = 0

(1000,0) $\longrightarrow$ Z = 32,000

(0,1200) $\longrightarrow$ Z = 28,800

(800,1200) $\longrightarrow$ Z = 54,400

(1000,1000) $\longrightarrow$ Z = 56,000

The optional sol'n is
975 miniback packs / week

(2) Variables
L = No. of large shirts
M = No. of medium shirts
S = No. of small shirts

b. Lp Models:
Objective function

Max $Z = 420L + 360M + 300S$
$L = L_1 + L_2 + L_3$
$M = M_1 + M_2 + M_3$
$S = S_1 + S_2 + S_3$

Constraints:
Capacity Constraint $L_1 + M_1 + S_1 \leq 750$
$L_2 + M_2 + S_2 \leq 900$
$L_3 + M_3 + S_3 \leq 450$

Storage Constraint
$20L_1 + 15M_1 + 12S_1 \leq 13000$
$20L_2 + 15M_2 + 12S_2 \leq 12000$

$$20L_3 + 15M_3 + 12M_3 \leq 5000$$

Same capicity percentage constraint

$$900(L_1 + m_1 + S_1) - 750(L_2 + M_2 + S_2) = 0$$

$$450(L_2 + m_2 + S_2) - 900(L_3 + M_3 + S_3) = 0$$

Non Negativily $L_1, L_2, L_3 \geq 0$

$M_1, M_2, M_3 \geq 0$

$S_1, S_2, S_3 \geq 0$