1.) Back Savers Model

a. Decision Variables: C = Collegiate
M = Mini

b. Objective Function: Max 32C + 24M
ST

c. Constraints: $3C + 2M \leq 5000$ sq ft
$45C + 40M \leq 84{,}000$ minutes
$C \leq 1000$
$M \leq 1200$

d. C = 1000
M = 975

$3(1000) + 2(975) = 4{,}950$ sq ft

$45(1000) + 40(975) = 84{,}000$ minutes

$32(1000) + 24(975) = \$55{,}400$

2.) Weigelt Corporation Model

a. Decision Variables: L1 = Large made in plant 1
M1 = Medium made in plant 1
S1 = Small made in plant 1
L2 = Large made in plant 2
M2 = Medium made in plant 2
S2 = Small made in plant 2
L3 = Large made in plant 3
M3 = Medium made in plant 3
S3 = Small made in plant 3

b. Max $420(L1+L2+L3) + 360(M1+M2+M3) + 300(S1+S2+S3)$
ST
$20L1 + 15M1 + 12S1 \leq 13000$
$20L2 + 15M2 + 12S2 \leq 12000$
$20L3 + 15M3 + 12S3 \leq 5000$
$(L1+L2+L3) \leq 900$
$(M1+M2+M3) \leq 1200$
$(S1+S2+S3) \leq 750$
$(L1+M1+S1)/(750) = (L2+M2+S2)/(900) = (L3+M3+S3)/(450)$
L1-3, M1-3, S1-3 ≥ 0