Solving Problems Involving Systems of Linear Inequalities in Two Variables

Total points = 22

1. Solution

Given:
300	=	total number of seats ✓
75	=	cost of each adult ticket ✓
55	=	cost of each child ticket ✓

Let:
a	=	number of adult tickets sold ✓
c	=	number of child tickets sold ✓

Ineq. 1: $a + c \leq 300$ ✓

Ineq. 2: $75a + 55c \geq 20{,}000$ ✓

Therefore, the system of linear inequalities that models this situation is $\begin{cases} a + c \leq 300 \\ 75a + 55c \geq 20000 \end{cases}$. ✓

2. Solution

Given:
80	=	cost of one pot of rose ✓
120	=	cost of one pot of sunflower ✓

Let:
x	=	number of roses to buy ✓
y	=	number of sunflowers to buy ✓

Ineq. 1: $x + y \geq 6$ ✓

Ineq. 2: $80x + 120y \leq 600$ ✓

Therefore, the system of linear inequalities that models this situation is $\begin{cases} x + y \geq 6 \\ 80x + 120y \leq 600 \end{cases}$. ✓

3. Solution

Given:
100	=	cost of each plant ✓
40	=	cost of soil per bag ✓

Let:
p	=	number of plants to buy ✓
s	=	number of bags of soil to buy ✓

Ineq. 1: $p \geq 5$ ✓

Ineq. 2: $100p + 40s \leq 1000$ ✓

Therefore, the system of linear inequalities that models this situation is $\begin{cases} p \geq 5 \\ 100p + 40s \leq 1000 \end{cases}$. ✓