640631125 Pimchanok Duang-In

Homework 5: Problem Solving

Mathematic: Optimization Model

Decision Variable

X_1 : The number of vanilla ice cream (boxes)

X_2: The number of strawberry ice cream (boxes)

Objective

Max profit: $2X_1 + 3X_2$

Constraints

1. Fresh milk: $0.5X_1 + 0.2X_2 \leq 10$ (1)
2. Doll: $X_1 + X_2 \leq 30$ (2)
3. $X_1 , X_2 \geq 0$

Result

- Find the proper number of vanilla ice cream and strawberry ice cream (box)

  (1)*2: $X_1 + 0.4X_2 = 20$ (3)

  (2)-(3) $0.6X_2 = 10$

  $X_2 = 16.67$

  Plug X_2 in (2) $X_1 + 16.67 = 30$

  $X_1 = 13.33$

  So, the proper number of vanilla ice cream (X_1) is equal to 13 boxes and the proper number of strawberry ice cream (X_2) is equal to 17 boxes.

- Find the maximum profit

  Let X_1 = 13 and X_2 = 17

  Max profit = 2(13) + 3(17)

  Max profit = 77

As a result, we will produce vanilla ice cream in 13 boxes and produce strawberry ice cream in 17 boxes to get a maximum profit of $77.