Group project: Mixing seeds

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Instructions

Students will complete **one** project as part of a group of 4-7 students. All students should participate in discussions on solving the given problem. All students should attempt the required computations, and agree on correct solutions. The solution of the project should be a single document in pdf format. This may be handwritten by a single student, but should represent the work of the whole group. All members of the group should be listed on the first page, and all group members may upload the same document on Canvas.

Problem specification

A farming supply store has three different mixtures of Bluegrass and Rye seeds. The following table describes the proportion of each type of seed in three different seed mixes.

	Deluxe Mix	Standard Mix	Economy Mix
Bluegrass	0.9	0.7	0.4
Rye	0.1	0.3	0.6

The store manager wants to create a new Special mix which will be 0.6 parts bluegrass and 0.4 parts rye. To be physically meaningful to the manager (who is not a financial mathematician) all your solutions should involve only non-negative real numbers.

Questions

Question 1: How can the manager mix x_1 units of Deluxe, x_2 units of Standard and x_3 units of Economy to create one pound of Special mix?

Question 2: Suppose that the cost per pound of the mixes is as follows:

Deluxe Mix	Standard Mix	Economy Mix
$10	$8	$4

Find the values of x_1, x_2 and x_3 which create the lowest cost of Special mix, and find the cost per pound.

Question 3: Suppose that Standard mix drops in cost, as follows:

Deluxe Mix	Standard Mix	Economy Mix
$10	$6	$4

What now is the most profitable way to create Special mix, and how much will it cost per pound?