

4 6 systems of equations mixture problems

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4 x 6 Systems of Equations Mixture Problems

Paragraph 1:

Mixtures involve combining two or more substances to create a new substance. In mixture problems, we often need to solve systems of equations to determine the quantities of each substance. A 4 x 6 system of equations is one that consists of four equations with six variables.

Paragraph 2:

Question: A store sells two types of trail mix. Mix A contains 25% almonds and 20% peanuts, while Mix B contains 15% almonds and 25% peanuts. A customer wants to create a mixture that contains 20% almonds and 22% peanuts. How many pounds of each mix should be used if the total quantity is 20 pounds?

Paragraph 3:

Answer: Let x represent the pounds of Mix A and y represent the pounds of Mix B. We can set up the following system of equations:

$$\begin{aligned}x + y &= 20 \quad (\text{Total quantity}) \\0.25x + 0.15y &= 0.20(20) \quad (\text{Amount of almonds}) \\0.20x + 0.25y &= 0.22(20) \quad (\text{Amount of peanuts})\end{aligned}$$

Solving this system yields: $x = 12$ and $y = 8$. Therefore, the customer should use 12 pounds of Mix A and 8 pounds of Mix B.

Paragraph 4:

Question: Two solutions of acid, Solution A and Solution B, contain 20% and 40% acid, respectively. How many gallons of each solution should be mixed to create 15 gallons of a solution that is 30% acid?

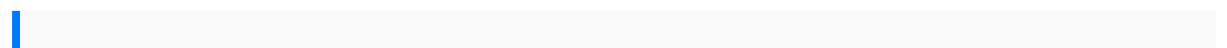
Paragraph 5:

Answer: Let x represent the gallons of Solution A and y represent the gallons of Solution B. We can set up the following system of equations:

$$x + y = 15 \text{ (Total quantity)}$$

$$0.20x + 0.40y = 0.30(15) \text{ (Amount of acid)}$$

Solving this system yields: $x = 7.5$ and $y = 7.5$. Therefore, 7.5 gallons of Solution A and 7.5 gallons of Solution B should be mixed.



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