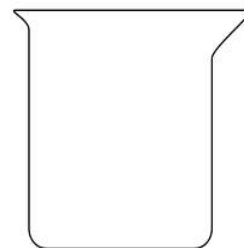
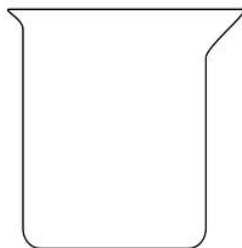
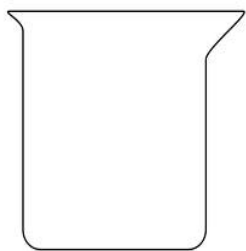


Applications of Linear Systems - Day 2

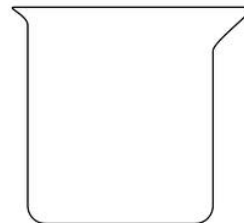
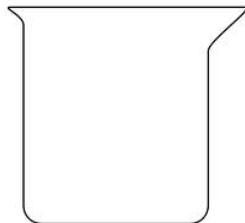
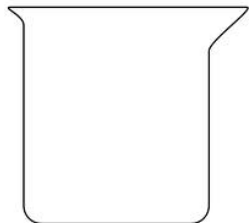
Linear systems can also be used to solve problems involving percentages.

To solve linear system applications involving mixtures:

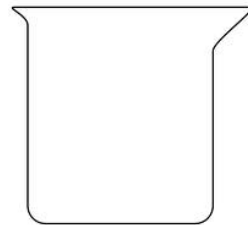
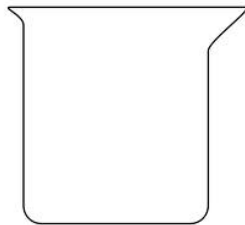
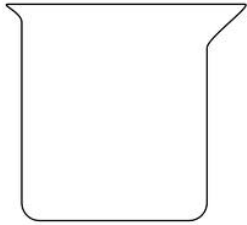
- a. Write a let statement to define your variables.
 - b. Draw a picture of three containers beside one another.
 - c. At the top of each container, write the amount used (for equation one).
 - d. In the middle of each container, write the price or percentage of each container. If it is a percentage, write it in decimal form.
 - e. At the bottom of each container, write the product of the amount and percent or price (for equation two).
 - f. Solve the linear system by substitution or comparison or elimination.
 - g. Write a concluding statement to answer the question.
1. Jellybeans and Reese Pieces, worth \$2.10/kg and \$2.70/kg respectively, are mixed to make 500 kg of a mixture that sells for \$2.52/kg. How many kilograms of Reese Pieces were used?



2. Ian has antifreeze that is 45% ethylene glycol by volume. He wants to make 10 L of a 60% solution by mixing his 45% solution with a 95% solution. What volume of each should he use?



3. A bulk food store has ordered two kinds of muesli. "Fruit First" boasts 32% raisins, while "Morning Sunshine" has only 14% raisins. How many kilograms of each kind of muesli must the owner mix together in order to prepare 5 kg of a special blend, "Just right," with 20% raisins?



Applications of Linear Systems

Day 2 Homework

1. White vinegar is a solution of acetic acid in water. There are two strengths of white vinegar – a 5% solution and a 10% solution. How many millilitres of each solution must be mixed to make 50 mL of a 9% vinegar solution?
2. One lawn fertilizer is 24% nitrogen and another is 12% nitrogen. How much of each fertilizer should be mixed to obtain 100 kg of fertilizer that is 21% nitrogen?
3. One type of granola is 30% fruit and another type is 15% fruit. What mass of each type of granola should be mixed to make 600 g of granola that is 21% fruit?
4. A health food store just received a 5 kg package of “On the Run” trail mix that contains 22% raisins. The store wants to add more raisins so that it contains 40% raisins. How many grams of raisins should they add to the mix? How much trail mix will they have in total after adding the raisins?
5. A store manager mixes orange pekoe tea worth \$1.50/kg and breakfast tea worth \$1.90/kg to make 200 kg of tea mixture that sells for \$1.67/kg. How many kilograms of each type of tea does he use?
6. What volume, in millilitres, of a 60% hydrochloric acid solution must be added to 100 mL of a 30% hydrochloric acid solution to make a 36% hydrochloric acid solution?

Answers

1. 10 mL of the 5% solution and 40 mL of the 10% solution
2. 75 kg of 24% nitrogen and 25 kg of 12% nitrogen
3. 240 g of 30% fruit and 360 g of 15% fruit
4. Add 1.5 kg of raisins and be left with 6.5 kg of trail mix
5. 115 kg of the orange pekoe tea and 85 kg of the breakfast tea
6. 25 mL