

Solving Word Problems Using Linear Equations - Part 2

Video Lecture

Sections 2.6 and 2.7

Course Learning Objective:

Solve applications of linear equations.

Weekly Learning Objectives:

Apply the 6-step problem solving strategy to:

- 1) Percent problems.**
- 2) Discount and mark-up problems.**
- 3) Mixture problems.**
- 4) Distance problems.**
- 5) Money problems.**
- 6) Interest rate problems.**

Solving Word Problems Using Linear Equations – Part 2

These lecture notes focus on percent applications.

Examples:

Ex: Sam made a taxable purchase of \$31.95. If the tax rate is 6.5%, what is the final purchase price?

$$\text{Purchase Price} = \text{Original Price} + \text{Tax}$$

$$\text{Purchase Price} = \text{Original Price} + \% \text{ Original Price}$$

Original Price Problems

Let's generalize this to general percent applications:

$$\text{NEW} = \text{OLD} \pm \% \cdot \text{OLD}$$

Ex: A dress is discounted 20% and the sale price is \$68.

What was the original price?

Ex: Ann received an $8\frac{1}{2}\%$ raise. If her new hourly rate is \$13.02 per hour, what was her original salary?

Mixture Problems

Ex: How many liters of 25% acid solution must be added to 80 liters of 40% acid solution to get a solution that is 30% acid?

Ex: Ink worth \$100 per barrel will be mixed with 30 barrels of ink worth \$60 per barrel to get a mixture worth \$75 per barrel. How many barrels of \$100 ink should be used?

Ex: How many gallons of 12% indicator solution must be mixed with a 20% indicator solution to get 10 gallons of a 14% solution?

Interest Rate Problems

Ex: Susie Williams inherited some money from her uncle. She deposited part of the money in a savings account paying 2%, and \$3000 more than that amount in a different account paying 3%. Her annual interest income was \$690. How much did she deposit at each rate?

Ex: Two investments produce an annual interest income of \$114. The total amount of money invested is \$4000, and the two interest rates paid are 2.5% and 3.5%. How much is invested at each rate?

Coin Problems

Ex: A coin collector has \$1.70 in dimes and nickels. She has 2 more dimes than nickels. How many nickels does she have?

Distance = Rate x Time Problems

Ex: Ann gets to school in 15 minutes if she rides her bike and in 45 minutes if she walks. She walks 10 miles per hour slower than she rides. What is her speed riding her bike?

Ex: From a point on a straight road, Lupe and Maria ride bicycles in opposite directions. Lupe rides 10 miles per hour and Maria rides 12 miles per hour. In how many hours will they be 55 miles apart?

Ex: Jeff leaves his house on his bike at 8:30 averaging 5 miles per hour. Joan leaves the same house at 9:00 and averages 8 miles per hour on the same path. At what time will Joan catch Jeff?

