

Section 4.4: PROBLEM USING SOLVING SYSTEMS OF EQUATIONS

When you are done with your homework you should be able to...

- π Solve problems using linear systems
- π Solve simple interest problems
- π Solve mixture problems
- π Solve motion problems

WARM-UP:

1. Solve the system of linear equations using the substitution or the addition method. Determine if the system is consistent or inconsistent, and if the equations are dependent or independent. Give your result in set notation.

a.

$$2x - 3y = 4$$

$$3x + 4y = 0$$

b.

$$x - y = 3$$

$$2x = 4 + 2y$$

A STRATEGY FOR SOLVING WORD PROBLEMS USING SYSTEMS OF EQUATIONS

When we solved problems in chapter 2, we let x represent a _____ that was _____. Problems in this section involve _____ unknown _____. We will let _____ and _____ represent the _____ quantities and _____ the English words into a _____ of _____ equations.

Example 1: The sum of two numbers is five. If one number is subtracted from the other, their difference is thirteen. Find the numbers.

Example 2: Each day, the sum of the average times spent on grooming for 15- to 19-year-old women and men is 96 minutes. The difference between grooming times for 15- to 19-year-old women and men is 22 minutes. How many minutes per day do 15- to 19-year-old women and men spend on grooming?

Example 3: A rectangular lot whose perimeter is 1600 feet is fenced along three sides. An expensive fencing along the lot's length costs \$20 per foot. An inexpensive fencing along the two side widths costs only \$5 per foot. The total cost of the fencing along the three sides comes to \$13000. What are the lot's dimensions?

Example 4: On a special day, tickets for a minor league baseball game cost \$5 for adults and \$1 for students. The attendance that day was 1281 and \$3425 was collected. Find the number of each type of ticket sold.

Example 5: You invested \$11000 in stocks and bonds, paying 5% and 8% annual interest. If the total interest earned for the year was \$730, how much was invested in stocks and how much was invested in bonds?

Example 6: A jeweler needs to mix an alloy with a 16% gold content and an alloy with a 28% gold content to obtain 32 ounces of a new alloy with a 25% gold content. How many ounces of each of the original alloys must be used?

A FORMULA FOR MOTION

Distance equals _____ times _____.

Example 7: When a plane flies with the wind, it can travel 4200 miles in 6 hours. When the plane flies in the opposite direction, against the wind, it takes 7 hours to fly the same distance. Find the rate of the plane in still air and the rate of the wind.

Example 8: With the current, you can row 24 miles in 3 hours. Against the same current, you can row only $\frac{2}{3}$ of this distance in 4 hours. Find your rowing rate in still water and the rate of the current.