

Date:

Section 2.3  
Intermediate Algebra  
Digital Notes

**Applications**

**Representing Unknowns in Terms of a Variable**

*Example* - The distance traveled in 3 hours at  $x$  miles per hour

*Example* - The perimeter of a rectangle if the width is ' $x$ ' feet and the length is 5 feet longer than the width

Now try 13, 16, 18.

**Writing Algebraic Expressions**

See page 90 for an abridged 'English to Math Dictionary' to help you with writing verbal expressions as mathematical expressions.

**Strategy for Solving Word Problems**

(See page 91 in the textbook)

1. Read the problem.
2. Draw a diagram to illustrate the problem, if possible.
3. Let your variable represent the thing you know the least about.
4. Represent any other unknowns in terms of that variable.
5. Write an equation to relate the unknowns together.
6. Solve the equation.
7. Answer the question posed in the problem.
8. Check your answer.

## Number Problems

*Example* - The sum of 3 consecutive integers is 84. Find the integers.

*Example* - Two consecutive odd integers have a sum of 128. Find the integers.

Now try 20, 22, 24, 28, 30. (More practice? 21, 27, 29)

## Geometric Problems ( $P = 2L + 2W$ )

*Example* - If the perimeter of a rectangular piece of glass is 26in and the length is 4in longer than the width, then what are the length and width?

*Example* - Fabian plans to fence a rectangular area for rabbits alongside his house. So he will use 14 feet of fencing to fence only three sides of the rectangle. If the side that runs parallel to the house is 2 feet longer than either of the other two sides, then what are the dimensions of the rectangular area?

Now try 32, 36, 38. (More practice? 31, 35, 39)

### **Investment Problems** ( $I = Pr$ )

*Example* - Bob invested some money at 5% simple interest and some money at 9% simple interest. The amount invested at the higher rate was twice the amount invested at the lower rate. If the total interest on the investments for 1 year was \$920, then how much did he invest at each rate?

*Example* - Norman invested one-half of his inheritance in a CD that had a 10% annual yield. He lent one-quarter of his inheritance to his brother-in-law at 12% simple interest. His income from these two investments was \$6400 for 1 year. How much was the inheritance?

Now try 44, 48. (More practice? 45, 49)

**Mixture Problems** ( $V = AC$  or  $Q = Ar$ )

*Example* - How many gallons of 5% acid solution should be mixed with 20 gallons of a 10% acid solution to obtain an 8% acid solution?

*Example* - Aaron mixes 12 pounds of dried apricots that sell for \$5 per pound with some dried cherries that sell for \$8 per pound. If he wants the mix to be worth \$7 per pound, then how many pounds of cherries should he use?

*Example* - Armond has two solutions available in the lab, one with 5% alcohol and another with 13% alcohol. How much of each should he mix together to obtain 6 gallons of a solution that contains 8% alcohol?

Now try 52, 54, 56. (More practice? 57, 58)

## Uniform Motion Problems ( $d = rt$ )

*Example* - A commuter bus takes 2 hours to get downtown; an express bus, averaging 25 mph faster, takes 45 minutes to cover the same route. What is the average speed for the commuter bus?

Now try 62, 64. (More practice? 59, 63)

## Commission Problems

*Example* - Sally bought a used Mustang. The selling price plus the 7% state sales tax was \$9041.50. What was the selling price?

Now try 68, 70. (More practice? 67)

## Miscellany

Don't forget to do the rest of the homework.

*Hint* - Be sure to read the problems carefully first and decide what formula applies before you start writing things down. Watch the units to make sure they all match up (and convert the numbers when the units do not match). Also, don't be surprised if you get answers that are fractions sometimes. You can do it!

Now try 76, 82, 86, 88, 94. (More practice? Take your pick of any odd problem between 71-106)