

# 1-9: Problem Solving With Equations

**OBJECTIVE:** To solve word problems by using an equation in one variable

## Guide to Problem Solving

### READ

- Read the problem twice
- Write what you know
- Write what you are trying to find

### PLAN

- Choose your strategy:



Work Backwards



Make An Organized List



Guess and Check



Draw Picture Or Diagram



Look for a Pattern



Make a Table



Solve Simpler Problem



Use Logical Reasoning



Use Models



Define Variable Write Equation



Write Number Sentences

### SOLVE

- Use your plan
- Clearly show all your work

### ANSWER

- Re-Read the question
- Label your answer

### CHECK

- Did you answer the question?
- Does your answer make sense?

### Plan for Solving a Word Problem:

- 1) **Read** the problem. Decide what numbers are asked for and what information is given.  
Make a **sketch** if it is helpful.
  
- 2) Choose a **variable**. **Label** your sketch with the variable, or put information into a **chart**.
  
- 3) **Write** an **equation** that represents relationships among the numbers in the problem.
  
- 4) **Solve** the equation and find the required numbers.
  
- 5) **Check** your answer by substituting it into the original statement.

## DO NOW:

1) Solve for  $x$ :  $\frac{6x - 2(x - 4)}{3} = 8$

2) Represent the word phrase in an algebraic expression:  
"The square of one more than a number"

3) Solve for  $x$ :  $y = mx + b$

4) A rectangular garden that is  $w$  ft wide is enclosed by 120 ft. of fencing. How long is the garden?

## HW Questions???

## Algebra Book

## Ch 1 - 9: Problem Solving with Equations

**1) Tickets to the Newton North production of Freshman Cabaret were \$19 for seats near the front and \$14 for rear seats. There were 525 more rear seats sold than front seats, and sales for all tickets totaled \$31,770. How many of each kind of tickets were sold?**

Question to be answered:

How many front tickets were sold? How many rear tickets were sold?

---

Information we know:

Price of front seat = \$19      Price of rear seat = \$14      All ticket sales = \$31,770

525 more rear seats sold than front seats.

Sketch :

Variable: (Can you compare one in terms of another?)

$f$  = # front seats sold

Equation (representing the relationship):

	Price	(number)	=	Sales
Front	\$19	$f$	=	$19f$
Rear	\$14	$f + 525$	=	$14(f + 525)$
		Total Sales	=	<u>\$31,770</u>
		$19 \cdot (f) + 14(f + 525)$	=	\$31,770

Solve Equation:

$$\begin{array}{r}
 19(f) + 14(f + 525) = 31,770 \\
 19(f) + 14(f) + 7,350 = 31,770 \\
 33(f) + 7,350 = 31,770 \\
 \underline{-7,350} \quad \underline{-7,350} \\
 33f = 24,420 \\
 \underline{33} \quad \underline{33} \\
 f = 740 \quad \text{-----> } 740 \text{ front seats sold, and} \\
 740 + 525 = 1,265 \text{ rear seats sold}
 \end{array}$$

Check answer:

$$\begin{array}{r}
 ? \\
 \$19(740) + \$14(1,265) = \$31,770 \\
 \$14,060 + \$17,710 = \$31,770 \\
 \underline{\$31,770} \quad \underline{\$31,770} \quad \text{Done}
 \end{array}$$

## Algebra Book

## Ch 1 - 9: Problem Solving with Equations

2) At noon, your plane leaves Logan Airport and heads west at 180 mi/hr. Its destination is Toronto, 500 miles away. 1 hour later a jet takes off from Logan and flies after the plane at 450 mi/hr. At what time will the jet overtake the plane? (Speed  $\cdot$  Time = Distance)

	Speed (mi/hr) $\cdot$	Time (hours) =	Distance (miles)
Plane			
Jet			

When do the distance of the plane and jet equal each other?

HW: p. 52 #1, 5, 9, 11, 19

D- Ch 1 Test Thursday

G- Ch 1 Test Friday

Review Packet Due day **before** test