T101 SECTION 4-2 EQUATIONS

SOLVING EQUATIONS

Solving equations simply means to find the value of the variable(s) that cause the equation to be true. To do this, we will be using some properties of equality.

PROPERTIES OF EQUATIONS

A. ADDITION PROPERTY OF EQUALITY

For any numbers *a, b,* and *c:*

IF $a = b$, THEN _____

B. MULTIPLICATION PROPERTY OF EQUALITY

For any numbers *a, b,* and *c:*

IF $a = b$, THEN _____

C. CANCELLATION PROPERTIES OF EQUALITY

1. For any numbers *a, b,* and *c:*

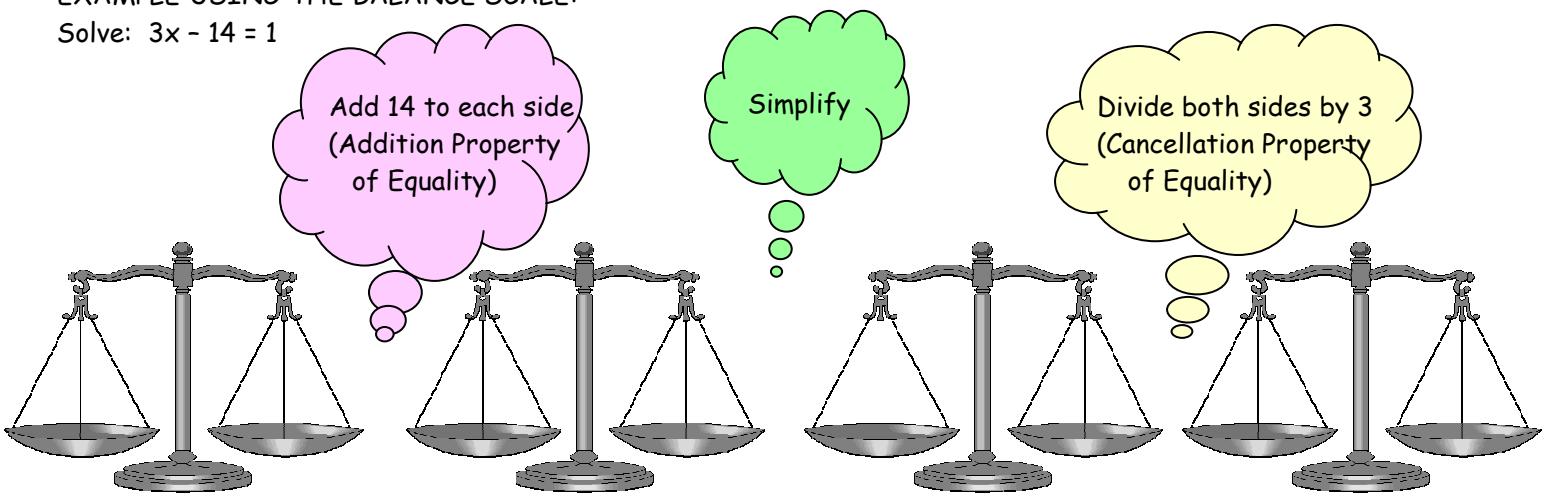
IF $a + c = b + c$, THEN _____

2. For any number *a, b,* and $c \neq 0$:

IF $ac = bc$, THEN _____

EXAMPLE USING THE BALANCE SCALE:

Solve: $3x - 14 = 1$



One way to think of "solving an equation" is to "isolate the variable" on one side of the equation so that it equals a numeric value on the other side.

Let's try some where we show <u>EVERY SINGLE STEP using a horizontal format</u>:

$x + 4 = 60$

$3x = x + 10$

$4x - 5 = 83$

$4x + 7x = 55$

$4(x + 3) - 5(x - 3) = 99$

V APPLICATION PROBLEMS (WORD PROBLEMS)

Using Polya's Four-Step Problem Solving Process:

1. Understand the Problem --------> Identify what is given and what is to be found
2. Devise a Plan --------> Assign variable to the unknown quantities and write an equation
3. Carry out the Plan --------> Solve the equation
4. Look Back --------> Interpret and check your solution

You will be graded on the following criteria for solving application problems using algebra:

a. Assign variables to the unknowns
(HINT: Use only one variable and adjust for the other unknowns)
b. Set up an algebraic equation (NO EQUATION = NO POINTS)
c. Solve the problem.

A farmer has 700 yards of fencing to enclose a rectangular pasture for her goats. Since one side of the pasture borders a river, that side does not need to be fenced. The side parallel to the river must be twice as long as the side perpendicular to the river. Find the dimensions of the rectangular pasture.

GROUP WORK

You will be graded on the following criteria for solving application problems using algebra:

a. Assign variables to the unknowns
   (HINT: Use only one variable and adjust for the other unknowns)
b. Set up an algebraic equation (NO EQUATION = NO POINTS)
c. Solve the problem.

In a small town, three children deliver all the newspapers. Abby delivers three times as many papers as Bob, and Connie delivers 13 more than Abby. If the three children delivered a total of 496 papers, how many papers does each child deliver?

Let: x *= the number of papers Bob delivers*
So, _____ *= the number of papers Abby delivers*
_____ *= the number of papers Connie delivers*

Bruno has five books overdue at the library. The fine for overdue books is 10¢ a day per book. He remembers that he checked out the algebra book one week prior to the four novels. If his total fine is $8.70, how long was each book overdue?

Let: x = _____