1.5 (Page 30) Variables and Equations

EQUATION -> a mathematical sentence that contains an equals sign (=)

Some equations contain only numbers.

25 - 15 = 10 (This is a true equation)

8 + 15 = 22 (This is a false equation)

OPEN SENTENCE -> an equation that contains at least one variable

(For example, 5 + x = 20 is an open sentence)

An open sentence is neither true nor false until the variable is replaced with some number.

When you replace the variable so that the equation is true, you have "solved the equation".

Any number that makes the equation true is called a SOLUTION to the equation.

Example: Which of the numbers (23, 31, or 41) is the solution of 94 + x = 125?

$94 + 23 \stackrel{?}{=} 125$

$117 \stackrel{?}{\neq} 125$

$94 + 31 \stackrel{?}{=} 125$

$125 \stackrel{?}{=} 125$ ✓

$94 + 41 \stackrel{?}{=} 125$

$135 \stackrel{?}{\neq} 125$

Example: Which of the numbers (18, 26, or 28) is the solution of 112 + x = 140?

$112 + 18 \stackrel{?}{=} 140$

$130 \neq 140$

$112 + 26 \stackrel{?}{=} 140$

$138 \neq 140$

$112 + 28 \stackrel{?}{=} 140$

$140 = 140$ ✓

Examples: Solve each equation mentally.

$15 = x - 6$

$x = 21$

$m + 19 = 41$

$m = 22$

$3m = 18$

$m = 6$

$68 - x = 27$

$x = 41$

$12 = y - 4$

$y = 16$

$8a = 120$

$a = 15$

$2x = 34$

$x = 17$

$x \div 4 = 37$

$x = 148$