Chapter 3: Equations

Properties of equality

1) If $a=b$ then $a = b$
   ex: $6 = 6$

2) If $a=b$ then $a = b$
   ex: $6 = 6$

3) If $a=b$ then $a = b$
   ex: $6 = 6$

4) If $a=b$ then $a = b$
   ex: $30 = 30$

SOLVE

1st step Problems

Addition
$x+6 = 8$

Subtraction
$x-8 = 4$

Multiplication
$-5x = 35$

Division
$\frac{x}{3} = -8$

Cross Multiplication
$4x = \frac{2}{3}$

$\frac{2}{5}x = \frac{4}{10}$

SOLVING AN EQUATION

2 STEP PROBLEMS

TO SOLVE an equation means to find the value of the variable.

ex: 1) $3x-2=10$

2) $4=10-3x$

3) $\frac{4}{5}x+2=10$

4) $-12x+4=16$

5) $\frac{x+3}{2}=-1$

6) $3(x+4)=24$

Part 3: Solving by combining like Terms

ex:

1) $4x-2x=8$

2) $2x-8=4x-10$

3) $3x-7.2+2x=4.8-x$

4) $-14=-(-2x+4)$

5) $3(x+2)-2(x-3)=14$

PART 4: DISTRIBUTION & CROSS MULTIPLICATION

1) $3(x-1)=15$

2) $2(x+3)-4(x-2)=100$

3) $\frac{x}{6}=\frac{3}{2}$

4) $\frac{3x+5}{4}=\frac{7}{2}$

5) $\frac{4(x-2)}{3}=\frac{2(x+2)}{5}$

SOLVING EQUATIONS WITH FRACTIONS

1) $\frac{4x}{9} + \frac{5x}{12} = \frac{31}{36}$

2) $\frac{x+2}{7} - \frac{x+3}{2} = \frac{3}{14}$

3) $\frac{x-9}{4} + 3 = \frac{x+2}{6}$

4) $\frac{1}{3}(x-\frac{1}{2}) - \frac{1}{4}(x-\frac{1}{3}) = \frac{1}{3}$

Mathematical Phrases

1. 6 is added to 4
2. a number increased by 6
3. a number tripled
4. a number plus twice the number
5. a number is decreased by 1
6. a number plus a number tripled is 8
7. the difference between a number and 16 is 20
8. 4 more than a number is 16
9. 4 times more than a number is 20
10. the quotient of a number and 8 is 2

Word Problems

1. The sum of twice a number and 4 is 14. Find the number.

2. The quotient of a number and 4 is 8. Find the number.

3. If a number is multiplied by 6 and 10 is added to the product, the result is 76. Find the number.