

Notes-Day 5: Solving Equations

1) -Term: A single number or variable, or the product of several numbers or variables, separated from another term by a + or - sign in an overall expression.

-Like Terms: Have exactly the same variables.

Solving means to (Have you Memorized these 5 Steps!)

- 1 - Distributive Property - to Eliminate Parenthesis
- 2 - Combine Like Terms - get same variable with same exponent together
- 3 - Get all Variables (x's) on one side of the equal sign
- 4 - Get all Constant numbers on the other side of the equal sign
- 5 - Multiply or Divide to get Variable (x) all by itself.

$$-3(x+2) = -3x-6$$

$$4x+5-2x=6$$

$$2x+5=6$$

Possible Solutions:

One Solution

No Solution

All Real Numbers

$$x = -6$$

$$-2 \neq 8$$

$$4 = 4$$

or

$$3 = x$$

$$x = x$$

Solve each equation. You must show at least three steps for each problem. NO CALCULATORS!

$$2) 7 = x + 2 + 6$$

$$7 = x + 8$$

$$-8 \quad -8$$

$$-1 = x$$

$$3) 3r + 3r = -6$$

$$6r = -6$$

$$\frac{6r}{6} = \frac{-6}{6}$$

$$r = -1$$

$$4) 4(3 + 5p) = 72$$

$$12 + 20p = 72$$

$$-12 \quad -12$$

$$20p = 60$$

$$\frac{20p}{20} = \frac{60}{20}$$

$$p = 3$$

$$5) 5(1 + 2x) - 6 = -61$$

$$5 + 10x - 6 = -61$$

$$10x - 1 = -61$$

$$+1 \quad +1$$

$$10x = -60$$

$$\frac{10x}{10} = \frac{-60}{10}$$

$$x = -6$$

$$6) -21 + 3n = -3(4n + 3) + 3n$$

$$-21 + 3n = -12n - 9 + 3n$$

$$-21 + 3n = -9n - 9$$

$$+9n \quad +9n$$

$$-21 + 12n = -9$$

$$+21 \quad +21$$

$$12n = 12$$

$$\frac{12n}{12} = \frac{12}{12}$$

$$n = 1$$

$$7) -10 + n = -4n + 5(n - 2)$$

$$-10 + n = -4n + 5n - 10$$

$$-10 + n = n - 10$$

$$-n \quad -n$$

$$-10 = -10$$

All Reals

$$-10 + n = n - 10$$

$$+10 \quad +10$$

$$n = n$$

$$\begin{array}{r}
 8) \quad -4 - 4(2r - 6) = 68 \\
 \underline{-4 - 8r + 24 = 68} \\
 20 - 8r = 68 \\
 \underline{-20} \qquad \underline{-20} \\
 -8r = 48 \\
 \underline{-8} \qquad \underline{-8} \\
 r = -6
 \end{array}$$

$-6 = r$

$$\begin{array}{r}
 9) \quad 66 = -6(1 - 4p) \\
 \underline{66 \quad -6 + 24p} \\
 \quad \underline{+6 \quad +6} \\
 72 = 24p \\
 \underline{24} \qquad \underline{24} \\
 3 = p
 \end{array}$$

$$\begin{array}{r}
 10) \quad -6(1 + 6x) = -x + 29 \\
 \underline{-6 - 36x = -x + 29} \\
 \quad \underline{+36x \quad +36x} \\
 -6 = 35x + 29 \\
 \underline{-29} \qquad \underline{-29} \\
 -35 = 35x \\
 \underline{35} \qquad \underline{35} \\
 -1 = x
 \end{array}$$

$$\begin{array}{r}
 11) \quad -6(1 + 3n) = -3 - 3n \\
 \underline{-6 - 3n = -3 - 3n} \\
 \quad \underline{+3n \quad +3n} \\
 -6 = -3 \\
 \text{No Sol.} \quad \emptyset: \text{Empty set}
 \end{array}$$

$$\begin{array}{r}
 12) \quad -2(-n - 1) - 1(1 + 5n) = -8 \\
 \underline{2n + 2 - 1 - 5n = -8} \\
 \quad \underline{-3n + 1 = -8} \\
 \quad \quad \underline{-1 \quad -1} \\
 -3n = -9 \\
 \underline{3} \qquad \underline{3} \\
 n = 3
 \end{array}$$

$$\begin{array}{r}
 13) \quad 3(-x + 4) + 4(2x + 4) = 33 \\
 \underline{-3x + 12 + 8x + 16 = 33} \\
 \quad \underline{5x + 28 = 33} \\
 \quad \quad \underline{-28 \quad -28} \\
 5x = 5 \\
 \underline{5} \qquad \underline{5} \\
 x = 1
 \end{array}$$

$$\begin{array}{r}
 14) \quad 3(1 + p) = -2p - 5(3 - p) \\
 \underline{3 + 3p = -2p - 5 + 3p} \\
 \quad \underline{3 + 3p = -5} \\
 \quad \quad \underline{-p \quad -p} \\
 -3 + 2p = -5 \\
 \underline{2p = -2} \\
 \underline{2} \qquad \underline{2} \\
 p = -1
 \end{array}$$

$$\begin{array}{r}
 15) \quad 3(2v - 3) = -5(1 - 2v) \\
 \underline{6v - 9 = -5 + 10v} \\
 \underline{-6v} \qquad \underline{-6v} \\
 -9 = -5 + 4v \\
 \underline{+5 \quad +5} \\
 -4 = 4v \\
 \underline{4} \qquad \underline{4} \\
 -1 = v
 \end{array}$$

$$\begin{array}{r}
 16) \quad 4(1 - 2x) = -5x - 1(x + 6) \\
 \underline{4 - 8x = -5x - x - 6} \\
 \underline{4 - 8x = -6x - 6} \\
 \quad \underline{+8x \quad +8x} \\
 4 = 2x - 6 \\
 \underline{+6 \quad +6} \\
 10 = 2x \\
 \underline{2} \qquad \underline{2} \\
 5 = x
 \end{array}$$

$$\begin{array}{r}
 17) \quad -6(5 - x) = -4(x - 3) - 2 \\
 \underline{-30 + 6x = -4x + 12 - 2} \\
 \underline{-30 + 6x = -4x + 10} \\
 \quad \underline{+4x \quad +4x} \\
 -30 + 10x = 10 \\
 \underline{+30 \quad +30} \\
 10x = 40 \\
 \underline{10} \qquad \underline{10} \\
 x = 4
 \end{array}$$