

Notes T1-07 Solving Multi-Step Equations

1) Solving Equations.

Steps to Solving Equations:

- 1) Dist. Prop.
- 2) Comb. Like Terms
- 3) All x's on one side
- 4) All constant on other side
- 5) Mult. / Divide to Solve

Possible Solutions:

- 1) one Sol.  $x=5$
- 2) No Sol.  $-7 \neq 3$
- 3) Inf. Sol. }  $x=x$   
 All Sol. } or  
 All Real }  $3=3$

Solving Equations.

$$2) \begin{array}{r|l} 2x = 96 & \\ \hline 12 & 12 \\ \hline x = 8 & \end{array}$$

$$3) \begin{array}{r|l} n + 11 = 3 & \\ \hline -11 & -11 \\ \hline n = -8 & \end{array}$$

$$5) \begin{array}{r|l} 10 = \frac{v}{5} & \\ \hline 50 = v & \end{array}$$

$$5) \begin{array}{r|l} 4 - k = -15 & \\ \hline -4 & -4 \\ \hline -k = -19 & \\ \hline -1 & -1 \\ \hline k = 19 & \end{array}$$

$$-1 \cdot -k = -19 \cdot -1$$

$$\begin{array}{r|l} k = 19 & \end{array}$$

$$6) \begin{array}{r|l} (x-10) = 1 \cdot 10 & \\ \hline +10 & +10 \\ \hline x-10 = 10 & \\ \hline +10 & +10 \\ \hline x = 20 & \end{array}$$

$$7) \begin{array}{r|l} -2x + 11 = 15 & \\ \hline -11 & -11 \\ \hline -2x = 4 & \\ \hline -2 & -2 \\ \hline x = -2 & \end{array}$$

Solve each equation.

$$8) \begin{array}{r|l} -3a + 8 - 8 = 0 & \\ \hline -3a + 0 = 0 & \\ \hline -3a = 0 & \\ \hline \frac{-3a}{-3} = \frac{0}{-3} & \\ \hline a = 0 & \end{array}$$

Note:  
 $\frac{0}{0} = \text{undefined}$

$$9) \begin{array}{r|l} -8 - 6k - k = 20 & \\ \hline -8 - 7k = 20 & \\ \hline +8 & +8 \\ \hline -7k = 28 & \\ \hline \frac{-7k}{-7} = \frac{28}{-7} & \\ \hline k = -4 & \end{array}$$

$$\begin{array}{r}
 10) \quad 273 = -7(6x+3) \\
 273 = -42x - 21 \\
 + 21 \qquad \qquad + 21 \\
 \hline
 294 = -42x \\
 -42 \qquad \qquad -42 \\
 \hline
 -7 = x
 \end{array}$$

$$\begin{array}{r}
 12) \quad 180 = 5(8+4x) \\
 180 = 40 + 20x \\
 -40 \qquad -40 \\
 \hline
 140 = 20x \\
 20 \qquad \qquad 20 \\
 \hline
 7 = x
 \end{array}$$

$$\begin{array}{r}
 14) \quad -1 - 5(n+3) = -9 - 5n \\
 -1 - 5n - 15 = -9 - 5n \\
 -5n - 16 = -9 - 5n \\
 +5n \qquad \qquad +5n \\
 \hline
 -16 = -9 \\
 \text{No Solution.}
 \end{array}$$

$$\begin{array}{r}
 16) \quad -r - 8 = -16 - 2r \\
 +2r \qquad \qquad +2r \\
 \hline
 r - 8 = -16 \\
 +8 \qquad \qquad +8 \\
 \hline
 r = -8
 \end{array}$$

$$\begin{array}{r}
 18) \quad 3(2-4x) = -6(x+2) \\
 6 - 12x = -6x - 12 \\
 +12x \qquad +12x \\
 \hline
 6 = 6x - 12 \\
 +12 \qquad \qquad +12 \\
 \hline
 18 = 6x \\
 \frac{18}{6} = \frac{6x}{6} \\
 3 = x
 \end{array}$$

$$\begin{array}{r}
 11) \quad 136 = 1 - 5(-7+5n) \\
 136 = 1 + 35 - 25n \\
 136 = 36 - 25n \\
 -36 \qquad -36 \\
 \hline
 100 = -25n \\
 -25 \qquad -25 \\
 \hline
 -4 = n
 \end{array}$$

$$\begin{array}{r}
 13) \quad -2(v+1) = 5 - v \\
 -2v - 2 = 5 - v \\
 +2v \qquad \qquad +2v \\
 \hline
 -2 = 5 + v \\
 -5 \qquad \qquad -5 \\
 \hline
 -7 = v
 \end{array}$$

$$\begin{array}{r}
 15) \quad k - k = 3 - 3k \\
 0 = 3 - 3k \\
 +3 \qquad \qquad +3 \\
 \hline
 3 = 3k \\
 -3 \qquad \qquad -3 \\
 \hline
 -1 = k
 \end{array}$$

$$\begin{array}{r}
 17) \quad -2(4-8x) + 5x = -176 \\
 -8 + 16x + 5x = -176 \\
 -8 + 21x = -176 \\
 +8 \qquad \qquad +8 \\
 \hline
 21x = -168 \\
 \frac{21x}{21} = \frac{-168}{21} \\
 x = -8
 \end{array}$$

$$\begin{array}{r}
 19) \quad 2(4+5k) = -4(-7-3k) \\
 8 + 10k = 28 + 12k \\
 -10k \qquad -10k \\
 \hline
 8 = 28 + 2k \\
 -28 \qquad -28 \\
 \hline
 -20 = 2k \\
 \frac{-20}{2} = \frac{2k}{2} \\
 -10 = k
 \end{array}$$