

Study Guide
3.1-3.4 Quiz
3.1: Solve One-Step Equations

- Be able to use inverse operations to isolate the variable and solve one-step equations

$$\begin{aligned} \underline{\text{Ex:}} \quad \frac{7}{2} \cdot \frac{2}{7} n &= -4 \cdot \frac{7}{2} \\ n &= -14 \end{aligned}$$

$$\begin{aligned} \underline{\text{Ex:}} \quad -5 + x &= -4 \\ +5 \quad +5 & \\ x &= 1 \end{aligned}$$

$$\begin{aligned} \underline{\text{Ex:}} \quad 1 - x &= -2 \\ -1 \quad -1 & \\ -x &= -3 \\ x &= 3 \end{aligned}$$

$$\begin{aligned} \underline{\text{Ex:}} \quad x - 4 &= -8 \\ +4 \quad +4 & \\ x &= -4 \end{aligned}$$

$$\begin{aligned} \underline{\text{Ex:}} \quad -2t &= 12 \\ -2 \quad -2 & \\ t &= -6 \end{aligned}$$

$$\begin{aligned} \underline{\text{Ex:}} \quad \frac{x}{-3} &= 4 \\ \cdot -3 \quad \cdot -3 & \\ x &= -12 \end{aligned}$$

3.2/3.3: Solve 2/Multi-Step Equations

- Be able to use inverse operations and reverse PEMDAS to solve multi-step equations

$$\begin{aligned} \underline{\text{Ex:}} \quad 4w + 2w &= 24 \\ \underline{6w} &= \underline{24} \\ 6 \quad 6 & \\ w &= 4 \end{aligned}$$

$$\begin{aligned} \underline{\text{Ex:}} \quad \frac{x}{2} + 5 &= 11 \\ -5 \quad -5 & \\ \frac{x}{2} &= 6 \\ \cdot 2 \quad \cdot 2 & \\ x &= 12 \end{aligned}$$

$$\begin{aligned} \underline{\text{Ex:}} \quad 3x - 5 &= 13 \\ +5 \quad +5 & \\ \underline{3x} &= \underline{18} \\ 3 \quad 3 & \\ x &= 6 \end{aligned}$$

$$\begin{aligned} \underline{\text{Ex:}} \quad 5x - 4(x - 3) &= 17 \\ 5x - 4x + 12 &= 17 \quad \text{*Distributing a} \\ 1x - 12 &= 17 \quad \text{NEGATIVE 4} \\ +12 \quad +12 & \\ x &= 29 \end{aligned}$$

$$\begin{aligned} \underline{\text{Ex:}} \quad \frac{4}{3} \cdot \frac{3}{4} (z - 6) &= 12 \cdot \frac{4}{3} \\ z - 6 &= 16 \\ +6 \quad +6 & \\ z &= 22 \end{aligned}$$

$$\begin{aligned} \underline{\text{Ex:}} \quad -4 &= 2(x - 2) - 3(1 - x) \\ -4 &= 2x - 4 - 3 + 3x \\ -4 &= 5x - 7 \\ +7 \quad +7 & \\ \underline{3} &= \underline{5x} \\ 5 \quad 5 & \\ x &= \frac{3}{5} \end{aligned}$$

3.4: Solve equations with variables on both sides

- Be able to solve equations with variables on both sides by moving variable terms together

Ex: $4x + 5 = 17 - 2x$

$$\begin{array}{r} +2x \quad \quad \quad +2x \\ \hline 6x + 5 = 17 \\ -5 \quad -5 \\ \hline 6x = 12 \\ \underline{6} \quad \underline{6} \\ x = 2 \end{array}$$

Ex: $3m - 25 - 8m = m - 14$

$$\begin{array}{r} -5m - 25 = m - 14 \\ +5m \quad \quad +5m \\ \hline -25 = 6m - 14 \\ +14 \quad \quad +14 \\ \hline -11 = 6m \\ \underline{6} \quad \underline{6} \\ m = -\frac{11}{6} \end{array}$$

Ex: $4(m - 3) = 2(6 - 2m)$

$$\begin{array}{r} 4m - 12 = 12 - 4m \\ +4m \quad \quad \quad +4m \\ \hline 8m - 12 = 12 \\ +12 \quad +12 \\ \hline 8m = 24 \\ \underline{8} \quad \underline{8} \\ m = 3 \end{array}$$

- Be able to identify when an equation has no solution, infinite solutions or 0 as the solution

Ex: $-5(3a - 4) = 7a + 27 - 7$

$$\begin{array}{r} -15a + 20 = 7a + 20 \\ +15a \quad \quad +15a \\ \hline 20 = 22a + 20 \\ -20 \quad -20 \\ \hline 0 = 22a \\ \underline{22} \quad \underline{22} \\ a = 0 \end{array}$$

(This problem has an answer, a can be 0)

Ex: $4(3x + 2) = 2(6x + 4)$

$$\begin{array}{r} 12x + 8 = 12x + 8 \\ -12x \quad -12x \\ \hline 8 = 8 \end{array}$$

ALL REAL NUMBERS

(this means that x can be anything)

Ex: $5z - 6 = (z - 1)5$

$$\begin{array}{r} 5z - 6 = 5z - 5 \\ -5z \quad -5z \\ \hline -6 = -5 \end{array}$$

NO SOLUTION

(this means that there is nothing that x can be)

Ex: $\frac{34x}{34} = \frac{17}{34}$

$$x = \frac{1}{2}$$

Ex: $\frac{9x}{9} = \frac{3}{9}$

$$x = \frac{1}{3}$$

Ex: $\frac{-4x}{-4} = \frac{2}{-4}$

$$x = -\frac{1}{2}$$

Ex: $\frac{-10x}{-10} = \frac{-5}{-10}$

$$x = \frac{1}{2}$$