

ALG 1: RATIONAL NUMBERS

SADMEP

Advanced Algebra 1: Solving Multi-Step Equations

NAME: _____

Notes and Examples:

$$1) \quad \begin{array}{r} -3x \quad | \quad -22 \\ \quad \quad | \quad +1 \\ \hline -3x \quad | \quad -21 \\ \quad \quad | \quad -3 \\ \hline \boxed{x = 7} \end{array}$$

check

$$\begin{aligned} -3(7) + 1 &= -22 \\ -21 + 1 &= -22 \\ -22 &= -22 \checkmark \end{aligned}$$

$$2) \quad \frac{2}{9}m + 17 = 23$$

$$9 \left(\frac{2}{9}m + 17 \right) = 9 \cdot 23$$

$$\begin{array}{r} 2m + 153 \quad | \quad 207 \\ \hline -153 \quad \quad | \quad -153 \\ \hline 2m \quad \quad \quad | \quad 54 \\ \hline \frac{2m}{2} \quad \quad \quad | \quad \frac{54}{2} \\ \hline \boxed{m = 27} \end{array}$$

check

$$\begin{aligned} \frac{2}{9}(27) + 17 &= 23 \\ 6 + 17 &= 23 \\ 23 &= 23 \checkmark \end{aligned}$$

$$3) \quad \begin{array}{r} 12 \quad | \quad 5 + \frac{7}{3}p \\ -5 \quad | \quad 5 \\ \hline \frac{3}{1} \cdot \frac{1}{3} \quad | \quad \left(\frac{3}{3}\right)P \left(\frac{3}{3}\right) \\ \hline \boxed{3 = P} \end{array}$$

check

$$\begin{aligned} 12 &= 5 + \frac{7}{3}(3) \\ 12 &= 5 + 7 \\ 12 &= 12 \checkmark \end{aligned}$$

$$4) \quad \begin{array}{r} 20 \cdot 4 \quad | \quad \frac{z-9}{20} \\ \hline 80 \quad \quad | \quad z-9 \\ +9 \quad \quad | \quad +9 \\ \hline \boxed{89 = z} \end{array}$$

check

$$\begin{aligned} 4 &= \frac{89-9}{20} \\ 4 &= \frac{80}{20} \\ 4 &= 4 \checkmark \end{aligned}$$

$$5) \quad \begin{array}{r} 11x + 4 \quad | \quad -8.5 \\ \hline 11x \quad \quad | \quad -4 \\ \hline \frac{11x}{11} \quad \quad | \quad \frac{-4}{11} \\ \hline \boxed{x = -4} \end{array}$$

check

$$\begin{aligned} 11(-4) + 4 &= -8.5 \\ -44 + 4 &= -40 \\ \frac{-40}{5} &= -8 \checkmark \end{aligned}$$

$$6) \quad \begin{array}{r} 15 - 12b \quad | \quad -9.5 \\ \hline -12b \quad | \quad -45 \\ +15 \quad \quad | \quad +15 \\ \hline -12b \quad | \quad -60 \\ -12 \quad \quad | \quad -12 \\ \hline \boxed{b = 5} \end{array}$$

check

$$\begin{aligned} 15 + 12(5) &= -9 \\ 15 + 60 &= 75 \\ \frac{75}{5} &= 15 \end{aligned}$$

$$\begin{aligned} 15 + (-60) &= -9 \\ -45 &= -9 \\ \frac{-45}{5} &= -9 \\ -9 &= -9 \checkmark \end{aligned}$$

$$2) \quad \frac{2}{9}m + 17 = 23$$

$$\begin{array}{r} \frac{2}{9}m + 17 \quad | \quad 23 \\ \hline \frac{2}{9}m \quad \quad | \quad 6 \\ \hline \frac{2}{9}m \quad \quad | \quad 6 \\ \hline \boxed{m = 27} \end{array}$$

$$3) \quad \frac{7}{3}p = 7.3$$

$$\begin{array}{r} 7p \quad \quad | \quad 21 \\ \hline \frac{7p}{7} \quad \quad | \quad \frac{21}{7} \\ \hline \boxed{p = 3} \end{array}$$

$$\frac{x}{5} = 5$$