

Solutions to WS 14.1 - Solving Equations with the Variable on Both Sides, # 1-12 all

$$\begin{aligned} \textcircled{1} \quad 3y - 2(3y + 2) &= 8 \\ \underline{3y} - \underline{6y} - 4 &= 8 \\ -3y - 4 &= 8 \\ \quad +4 \quad +4 & \\ -3y &= 12 \\ \underline{-3} \quad \underline{-3} & \\ \boxed{y = -4} \end{aligned}$$

$$\begin{aligned} \textcircled{2} \quad m - 12 &= 3m + 4 \\ \quad -3m \quad -3m & \\ -2m - 12 &= 4 \\ \quad +12 \quad +12 & \\ -2m &= 16 \\ \underline{-2} \quad \underline{-2} & \\ \boxed{m = -8} \end{aligned}$$

$$\begin{aligned} \textcircled{3} \quad 4m - 5 &= 3m + 7 \\ \quad -3m \quad -3m & \\ m - 5 &= 7 \\ \quad +5 \quad +5 & \\ \boxed{m = 12} \end{aligned}$$

$$\begin{aligned} \textcircled{4} \quad 5x + 32 &= 8 - x \\ \quad +x \quad +x & \\ 6x + 32 &= 8 \\ \quad -32 \quad -32 & \\ 6x &= -24 \\ \underline{6} \quad \underline{6} & \\ \boxed{x = -4} \end{aligned}$$

$$\begin{aligned} \textcircled{5} \quad 15 - 3y &= y + 13 + y \\ 15 - 3y &= 2y + 13 \\ \quad -2y \quad -2y & \\ 15 - 5y &= 13 \\ \quad -15 \quad -15 & \\ -5y &= -2 \\ \underline{-5} \quad \underline{-5} & \\ \boxed{y = \frac{2}{5}} \end{aligned}$$

$$\begin{aligned} \textcircled{6} \quad 3w - 1 - 4w &= 4 - 2w \\ \quad -w - 1 &= 4 - 2w \\ \quad +2w \quad +2w & \\ w - 1 &= 4 \\ \quad +1 \quad +1 & \\ \boxed{w = 5} \end{aligned}$$

$$\begin{aligned} \textcircled{7} \quad 9y - 8 + 4y &= 7y + 16 \\ 13y - 8 &= 7y + 16 \\ \quad -7y \quad -7y & \\ 6y - 8 &= 16 \\ \quad +8 \quad +8 & \\ 6y &= 24 \\ \underline{6} \quad \underline{6} & \\ \boxed{y = 4} \end{aligned}$$

$$\begin{aligned} \textcircled{8} \quad 4z + 10 &= 6(3z - 2) \\ 4z + 10 &= 18z - 12 \\ \quad -18z \quad -18z & \\ -14z + 10 &= -12 \\ \quad -10 \quad -10 & \\ -14z &= -22 \\ \underline{-14} \quad \underline{-14} & \\ \boxed{z = \frac{11}{7}} \end{aligned}$$

$$\textcircled{9} \quad 2(2x+3) = 8x+5$$

$$4x+6 = 8x+5$$

$-8x \quad -8x$

$$-4x+6 = 5$$

$-6 \quad -6$

$$-4x = -1$$

$-4 \quad -4$

$$\boxed{x = \frac{1}{4}}$$

$$\textcircled{10} \quad 2m-4 = 2(6-7m)$$

$$2m-4 = 12-14m$$

$+14m \quad +14m$

$$16m-4 = 12$$

$+4 \quad +4$

$$\frac{16m}{16} = \frac{16}{16}$$

$$\boxed{m = 1}$$

$$\textcircled{11} \quad 3(2r-1) + 5 = 5(r+1)$$

$$6r - 3 + 5 = 5r + 5$$

$$6r + 2 = 5r + 5$$

$-5r \quad -5r$

$$r + 2 = 5$$

$-2 \quad -2$

$$\boxed{r = 3}$$

$$\textcircled{12} \quad 8y-4 + 3(y+7) = 6y - 3(y-3)$$

$$\underline{8y} - 4 + \underline{3y} + \underline{21} = \underline{6y} - \underline{3y} + 9$$

$$11y + 17 = 3y + 9$$

$-3y \quad -3y$

$$8y + 17 = 9$$

$-17 \quad -17$

$$\frac{8y}{8} = \frac{-8}{8}$$

$$\boxed{y = -1}$$