

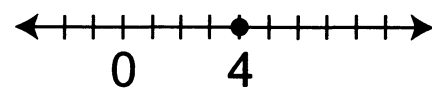
SOLUTION STATEMENTS

$$\begin{array}{c} \vdots \\ x = 4 \end{array}$$

Roster

$$S = \{4\}$$

Graph



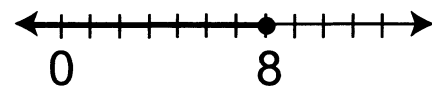
$$\begin{array}{c} \vdots \\ n \leq 8 \end{array}$$

~~Roster~~

Rule

$$S = \{n \mid n \leq 8\}$$

Graph



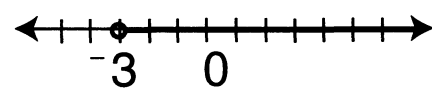
$$\begin{array}{c} \vdots \\ z > -3 \end{array}$$

~~Roster~~

Rule

$$S = \{z \mid z > -3\}$$

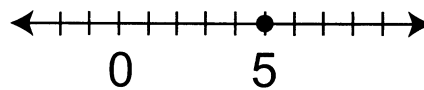
Graph



MAKING ZEROS

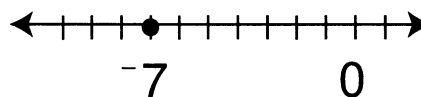
$$\begin{array}{rcl}
 & n + 3 & = 8 \\
 \text{Add } ^{-}3 & n + 3 + ^{-}3 & = 8 + ^{-}3 \\
 & n & = 5 \checkmark \\
 \text{Check} & (5) + 3 & = 8 \\
 & 8 & = 8 \quad \text{True}
 \end{array}$$

$$S = \{5\}$$



$$\begin{array}{rcl}
 & m - 4 & = -11 \\
 \text{Add } ^{+}4 & m - 4 + ^{+}4 & = -11 + ^{+}4 \\
 & m & = -7 \checkmark \\
 \text{Check} & (-7) - 4 & = -11 \\
 & -11 & = -11 \quad \text{True}
 \end{array}$$

$$S = \{-7\}$$



MAKING ONES

$$5x = 35$$

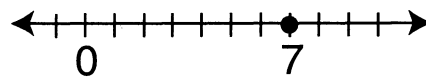
Multiply $\frac{1}{5}$ $\frac{1}{5}(5x) = \frac{1}{5}(35)$

$$1x = \frac{35}{5} \text{ or } 7 \checkmark$$

Check $5(7) = 35$

$$35 = 35 \quad \text{True}$$

$$S = \{7\}$$



$$\frac{z}{3} = 2$$

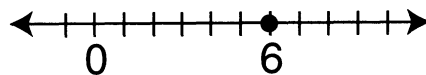
Multiply $\frac{3}{1}$ $\frac{3}{1}\left(\frac{z}{3}\right) = \frac{3}{1}(2)$

$$1z = \frac{6}{1} \text{ or } 6 \checkmark$$

Check $\frac{(6)}{3} = 2$

$$2 = 2 \quad \text{True}$$

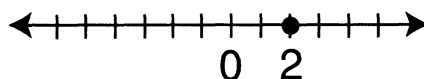
$$S = \{6\}$$



COMBINATIONS

$$\begin{array}{rcl}
 & 3w + 4 & = 10 \\
 \text{Add } ^{-}4 & 3w + 4 + ^{-}4 & = 10 + ^{-}4 \\
 & 3w & = 6 \\
 \text{Multiply } \frac{1}{3} & \frac{1}{3}(3w) & = \frac{1}{3}(6) \\
 & 1w & = \frac{6}{3} \text{ or } 2 \\
 \text{Check} & 3(2) + 4 & = 10 \\
 & 6 + 4 & = 10 \\
 & 10 & = 10 \qquad \text{True}
 \end{array}$$

$$S = \{2\}$$



Or ...

$$\begin{array}{rcl}
 & 3w + 4 & = 10 \\
 \text{Multiply } \frac{1}{3} & \frac{1}{3}(3w + 4) & = \frac{1}{3}(10) \\
 & w + \frac{4}{3} & = \frac{10}{3} \\
 \text{Add } \frac{-4}{3} & w + \frac{4}{3} + \frac{-4}{3} & = \frac{10}{3} + \frac{-4}{3} \\
 & w & = \frac{6}{3} \text{ or } 2 \checkmark
 \end{array}$$

COMPLICATIONS

“Grouping Symbols”

$$2(4x - 5) = 14$$

Distribute $8x - 10 = 14$

Add 10 $8x - 10 + +10 = 14 + +10$

$$8x = 24$$

Multiply $\frac{1}{8}$ $\frac{1}{8}(8x) = \frac{1}{8}(24)$

$$1x = \frac{24}{8} \text{ or } 3 \checkmark$$

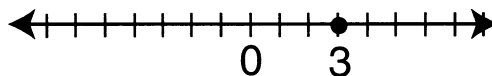
Check $2(4[3] - 5) = 14$

$$2(12 - 5) = 14$$

$$2(7) = 14$$

$$14 = 14 \quad \text{True}$$

$$S = \{3\}$$



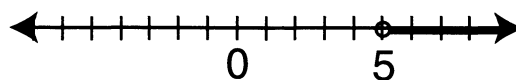
“DISTRIBUTE”

COMPLICATIONS

“Like Terms on the Same Side”

$$\begin{array}{rcl}
 & 7m - 3m + 2 & > 17 + 5 \\
 \text{C.L.T.} & 4m + 2 & > 22 \\
 \text{Add } -2 & 4m + 2 +^{-}2 & > 22 +^{-}2 \\
 & 4m & > 20 \\
 \text{Multiply } \frac{1}{4} & \frac{1}{4}(4m) & > \frac{1}{4}(20) \\
 & 1m & > \frac{20}{4} \text{ or } 5 \checkmark \\
 \\
 \text{Check} & 7(6) - 3(6) + 2 & > 17 + 5 \\
 & 42 - 18 + 2 & > 22 \\
 & 24 + 2 & > 22 \\
 & 26 & > 22 \quad \text{True}
 \end{array}$$

$$S = \{m \mid m > 5\}$$



“COLLECT LIKE TERMS”

COMPLICATIONS

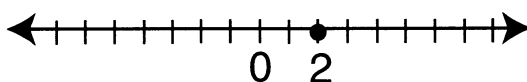
“Placeholders on Both Sides”

$$\begin{array}{rcl}
 & 3z - 11 & = 9 - 7z \\
 \text{Add } ^-3z & 3z - 11 + ^-3z & = 9 - 7z + ^-3z \\
 & -11 & = 9 - 10z \\
 \text{Add } ^-9 & -11 + ^-9 & = 9 - 10z + ^-9 \\
 & ^-20 & = ^-10z \\
 \text{Multiply } \frac{1}{^-10} & \frac{1}{^-10} (^-20) & = \frac{1}{^-10} (^-10z) \\
 & \frac{^-20}{^-10} \text{ or } 2 & = 1z \checkmark
 \end{array}$$

Or...

$$\begin{array}{rcl}
 & 3z - 11 & = 9 - 7z \\
 \text{Add } 7z & 3z - 11 + ^+7z & = 9 - 7z + ^+7z \\
 & 10z - 11 & = 9 \\
 \text{Add } 11 & 10z - 11 + ^+11 & = 9 + ^+11 \\
 & 10z & = 20 \\
 \text{Multiply } \frac{1}{10} & \frac{1}{10} (10z) & = \frac{1}{10} (20) \\
 & 1z & = \frac{20}{10} \text{ or } 2 \checkmark
 \end{array}$$

$$S = \{2\}$$



“ADD THE OPPOSITE OF ONE GROUP”

HIERARCHY

$$2y + 5 + 3y + 7 \leq 13 + 4(2y - 1)$$

Distribute

$$2y + 5 + 3y + 7 \leq 13 + 8y - 4$$

C.L.T.

$$5y + 12 \leq 9 + 8y$$

Add $-5y$

$$5y + 12 + ^{-}5y \leq 9 + 8y + ^{-}5y$$

$$12 \leq 9 + 3y$$

Add -9

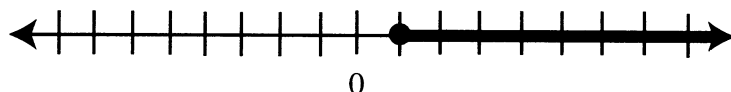
$$12 + ^{-}9 \leq 9 + 3y + ^{-}9$$

$$3 \leq 3y$$

Multiply $\frac{1}{3}$

$$\frac{1}{3}(3) \leq \frac{1}{3}(3y)$$

$$\frac{3}{3} \text{ or } 1 \leq 1y \checkmark$$



Check

$$2(5) + 5 + 3(5) + 7 \leq 13 + 4(2[5] - 1)$$

$$10 + 5 + 15 + 7 \leq 13 + 4(10 - 1)$$

$$15 + 15 + 7 \leq 13 + 4(9)$$

$$30 + 7 \leq 13 + 36$$

$$37 \leq 49 \quad \text{True}$$

1. Grouping symbols (Distribute)
2. Like terms on the same side (Collect)
3. Placeholders on both sides (Get rid of one group)
4. Make 0's (Add opposite)
5. Make 1's (Multiply reciprocal)