

Do Now:

Solve:

①  $3x - 5 = 8$

$$\frac{5}{x} = 10$$

$$\frac{x}{7} = -3$$

## Solving One Step Equations

Goal: isolate the variable

How: perform opposite operations

★ When moving across the = sign, you must do the opposite!

$$\begin{array}{r|l} x - 2 & = 5 \\ \hline +2 & +2 \\ \hline x & = 7 \end{array}$$

$$w = -18$$

$$\begin{array}{r|l} 5 - w & = 23 \\ \hline -5 & -5 \\ \hline -1w & = 18 \\ \hline -1 & -1 \end{array}$$

adding	subtracting
multiplying	dividing
positive	negative
Square	Square root

## Solving Multi-Step Equations

Goal is to isolate the variable.

The very last should get the variable by itself.

$$\begin{array}{r} \text{Ex: } \textcircled{3} \quad 5 - 9w = 23 \\ -5 \quad -5 \\ \hline -9w = 18 \\ \frac{-9w}{-9} = \frac{18}{-9} \\ \boxed{w = -2} \end{array}$$

$$\text{Ex } \textcircled{4}: \quad \frac{3}{2}a - 8 = 7$$

$$\frac{2}{3} \left( \frac{3}{2}a \right) = \frac{15}{1} \left( \frac{2}{3} \right)$$

$$a = \frac{30}{3}$$
$$\boxed{a = 10}$$

• When solving multistep equations,

Use order of operations in reverse order.

SADMEP  
ASMD

★ Still use opposite operations

★ Reciprocal = Flip Fraction

$$\frac{1}{5} = \frac{5}{1} \text{ or } 5$$

$$\frac{3}{4} = \frac{4}{3}$$

$$\text{Ex: } 7 = \frac{\boxed{C}}{-5} + \frac{3}{-3}$$

$$-5(4) = \left(\frac{C}{-5}\right) \cdot \frac{-5}{1}$$

$$-20 = C$$

$$\frac{z-7}{5} = (-3)5$$

$$\begin{array}{r} z-7 = -15 \\ +7 \quad +7 \\ \hline z = -8 \end{array}$$

## DO NOW

$$1. -20 = -4x - 6x$$

$$2. 6 = 1 - 2n + 5$$

$$3. 8x - 2 = -9 + 7x$$

$$7 = \frac{C}{-5} + 3$$

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-3                      -B

$$s(4) = \left( \frac{C}{-5} \right) = \frac{-8}{1}$$

$$-20 = C$$

$C = -20$

$$\frac{2t - (-4)}{-5} = (-2) - 5$$

$$2t + 4 = 10$$

$$\begin{array}{r} 2t + 4 = 10 \\ -4 \quad -4 \\ \hline 2t = 6 \end{array}$$

$$\frac{2t}{2} = \frac{6}{2}$$

$$t = 3$$

$$13.7x - \cancel{6.5} = -2.3x + 8.3$$

$+ \cancel{6.5}$  $+ \cancel{6.5}$

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$$13.7x = \cancel{-2.3x} + 14.8$$

$+ 2.3x$        $+ \cancel{2.3x}$

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$$\frac{16x}{16} = \frac{14.8}{16}$$

$$x = 0.925$$

$$6(y+2) - 4 = -10$$



Do Now:

Write the definition of inequality.

## Solving Inequalities:

Equation - a number sentence that contains =

Inequality - a number sentence that contains  $<$ ,  $>$ ,  $\leq$ , or  $\geq$

In an equation there is one set answer (no solution, infinite solutions, or  $x =$ )

In an inequality there is a set of answers.

To solve an inequality is similar to solving equations.

$$\begin{array}{r} x - 7 > 3 \\ \hline +7 \qquad +7 \\ \hline x > 10 \end{array}$$

$$\begin{array}{r} 14b \leq 70 \\ \hline 14 \qquad 14 \\ \hline \end{array}$$

$$b \leq 5$$

KEY Thing to remember:

If you MULTIPLY or DIVIDE  
by a NEGATIVE, you must  
flip the inequality (sign)

$$\begin{array}{r} x + 8 > -3 \\ \underline{-8 \quad -8} \\ x > -11 \end{array}$$

$$\frac{-6}{1} \left( \frac{x}{-6} \right) \leq (48)^{-6}$$

$$x \geq -288$$

$$\begin{array}{r} ① \quad 5x - 7 > 23 \\ \quad \quad +7 \quad +7 \\ \hline 5x \quad 30 \\ \hline 5 \quad 5 \\ \hline X \Rightarrow 6 \end{array}$$

$$\begin{array}{r} ② \quad \frac{-6x+2}{-2} \leq \frac{36}{-2} \\ \hline -6x+2 \leq 36 \\ \hline -6x \leq 34 \\ \hline \frac{-6x}{-6} \leq \frac{34}{-6} \\ X \geq 5.67 \end{array}$$

$$\begin{array}{r} ③ \quad \frac{-8}{p} + 4 > 2 \\ \quad \quad -4 \quad -4 \\ \hline p \left( \frac{-8}{p} \right) > (-2) \\ \hline \frac{-8}{2} > \frac{-2p}{-2} \\ \hline 9 < p \end{array}$$

$$\frac{-6m - 3}{-2} \geq -10$$

① Do Now: Week 8:

$$\frac{-7x - 4}{2} \geq 31$$

③  $9x + 17 \leq 21$

②  $6x - 14 < 3x - 2$

Justifying when Solving equations and Inequalities:

- Tell what property you used in each step of solving.

$$3x - 8 = 13$$

$$-4(x - 3) \geq 2x - 8$$



Solve and justify.

$$\textcircled{1} 5x - 8 \leq 2x - 9$$

$$\textcircled{2} \frac{6x - 4}{3} = 10$$

$$\textcircled{3} 2(4x - 4) \leq 13$$

$$\textcircled{1} \frac{8x+20}{3} \leq 15$$

$$\textcircled{2} 0 > 3x-3-6$$

$$\textcircled{3} -2(b+1)+4 < 10$$

Do Now:

Solve and Justify.

$$5x - 8 \geq 13$$

$$\frac{6x - 4}{3} = -12$$

$$\textcircled{1} 0 > 3x - 3 - 6$$

$$0 > 3x - 9$$
$$\begin{array}{r} +9 \qquad +9 \\ \hline \end{array}$$

$$\frac{9}{3} > \frac{3x}{3}$$

$$\textcircled{3 > x}$$

$$\textcircled{2} -5(1-4a) = -5$$

$$\begin{array}{r} -5 + 20a = -5 \\ +5 \qquad \qquad +5 \end{array}$$

$$\frac{20a}{20} = \frac{0}{20}$$

$$\textcircled{a=0}$$

$$\textcircled{3} \quad 4x + \underbrace{1 - 1} \geq -8$$

$$\frac{4x}{4} \geq \frac{-8}{4}$$

$$\boxed{x \geq -2}$$

$$\textcircled{4} \quad \overbrace{3(6b-1)} = 18-3b$$

$$\begin{array}{r} 18b - 3 = 18 - 3b \\ +3 \quad +3 \end{array} \quad \begin{array}{l} \text{Distribute / Multiply} \\ \text{Addition} \end{array}$$

$$\begin{array}{r} 18b = 21 - 3b \\ +3b \quad +3b \end{array} \quad \begin{array}{l} \text{Simplify} \\ \text{Addition} \end{array}$$

$$\frac{21b}{21} = \frac{21}{21} \quad \begin{array}{l} \text{Simplify} \\ \text{Divide} \\ \text{Simplify} \end{array}$$

$$\boxed{b=1}$$

$$\textcircled{a} -6 = 5n + 5 + 4$$

$$\begin{array}{r} -6 = 5n + 9 \\ -9 \quad -9 \\ \hline \end{array}$$

$$\begin{array}{r} -15 = 5n \\ \hline 5 \quad 5 \end{array}$$

$$\textcircled{-3 = n}$$

$$\textcircled{b} 3 - 2(n - 4) = -1$$

$$\underline{3} - 2n + \underline{8} = -1$$

$$\begin{array}{r} 11 - 2n = -1 \\ \cdot 1 \quad \cdot 11 \\ \hline \end{array}$$

$$\begin{array}{r} -2n = -12 \\ \hline -2 \quad -2 \end{array}$$

$$\textcircled{n = 6}$$

$$\textcircled{1} -2(\overbrace{b+1})+4 < 10$$

$$-2b - \underline{2} + 4 < 10$$

$$-2b + 2 < 10$$

$$\textcircled{2} a - 15 = -4(-b + 3a)$$

$$\textcircled{9} -1 \leq 2n + 4 - 5$$

$$\textcircled{10} 7 < -(k-3) + 2$$











