Objective: Students will be able to:
· solve equations by getting all variables on the same side of the equation.
· write and justify appropriate properties to steps.

Addition and Multiplication Properties

Distribution Property:
$a(b + c) = ab + ac$

Example:
$6(7 + 8) = 6*7 + 6*8$
$= 42 + 48$
$= 90$

Words to Remember

Commutative property of addition
$a + b = b + a$
Example: $6 + 7 = 7 + 6$

Associative property of addition
$(a + b) + c = a + (b + c)$
Example: $(6 + 7) + 8 = 6 + (7 + 8)$

Identity property of addition
$a + 0 = a$
Example: $8 + 0 = 8$

Inverse property of addition
$a + (-a) = 0$
Example: $8 + (-8) = 0$

Commutative property of multiplication
$ab = ba$
Example: $6 \cdot 7 = 7 \cdot 6$

Associative property of multiplication
$(ab)c = a(bc)$
Example: $(6 \cdot 7)8 = 6(7 \cdot 8)$

Identity property of multiplication
$a \cdot 1 = a$
Example: $8 \cdot 1 = 8$

Inverse property of multiplication
$a \cdot \frac{1}{a} = 1$
Example: $8 \cdot \frac{1}{8} = 1$

Properties of Equality	**Properties of addition and Multiplication**
These properties allow us to balance and solve equations involving real numbers.	These properties are the definition of how numbers should behave.

ex/

(+) prop. $=$

(*) prop. $=$

ex/

$3 + 4 = 7$

$4 + 3 = 7$

$5 \cdot 2 = 10$

$2 \cdot 5 = 10$

1 **Example**

$6m + 5 - 7m = 10 - 5m + 3$ *Steps/Reason*

① $-m + 5 = 13 - 5m$ ① Combine like terms

② $+5m \qquad +5m$ ② (+) prop. $=$

$\quad 4m + 5 = 13$

③ $\qquad -5 \quad -5$ ③ $-$ prop. $=$

$\quad \dfrac{4m}{4} = \dfrac{8}{4}$

④   ④ $\left(\dfrac{\circ}{\circ}\right)$ prop. $=$

$\quad m = 2$

2 Example

$8w + 4 - 2w = w + 1$	Steps/Reason
① $6w + 4 = w + 1$	① Combine like terms
② $ +4 \qquad -4$	② $-$ prop $=$
$6w = w - 3$	
③ $-w \qquad -w$	③ $-$ prop $=$
$\dfrac{5w}{5} = \dfrac{-3}{5}$	④ $\dfrac{\div}{}$ prop. $=$
④ $w = \dfrac{-3}{5}$	

3 Example

$3(n-2) - 1 = 2 - 5(n+5)$	Steps/Reason
① $3n - 6 - 1 = 2 - 5n - 25$	① Distributive prop.
② $3n - 7 = -23 - 5n$	② Combine like terms.
③ $ +7 \qquad +7$	③ $+$ prop. $=$
$3n = -16 - 5n$	
④ $+5n \qquad +5n$	④ $+$ prop. $=$
$\dfrac{8n}{8} = \dfrac{-16}{8}$	⑤ $\div$ prop $=$
⑤ $\boxed{n = -2}$	

Quiz Corrections

Problem	Correction	Reason

#2

$y - y = m(x - x)$ $\overset{x}{(5,}\overset{y}{-1)}\overset{x}{(-3,}\overset{y}{2)}$

$y + 1 = \dfrac{2 + 1}{-3 - 5}(x - 5)$

$y + 1 = -\dfrac{3}{8}(x - 5) \quad -\dfrac{3}{8}\overset{x}{x} - 5 \quad \dfrac{15}{8}$

$y + 1 = 3/8x + 15/8$

$\boxed{y = \dfrac{-3}{8}x + \dfrac{7}{8}}$

$\dfrac{15}{8} \quad -\dfrac{1}{1} \cdot \dfrac{8}{8}$

$\dfrac{7}{8}$

Reason: • The reason I got this wrong was because I forgot how to distribute the $-3/8$ to the -5 so then when I moved the $+1$ over it was all wrong.

#4

$y - y = m(x - x)$ $m(v) = 1\left(\boxed{2/5}x\right)$

$\overset{x}{(2,}\overset{y}{-3)}$

$y + 3 = \dfrac{5}{2}(x - 2)$ $m\downarrow = \dfrac{5}{2}$

$y + 3 = \dfrac{5}{2}x - \dfrac{10}{2}$ $-\dfrac{10}{2}$

$+3 \quad -3$

$\boxed{y = \dfrac{5}{2}x - 8}$

$\dfrac{-16}{2} - \dfrac{8}{1} = -8$

Reason: • The 1 threw me off when I only needed the inv or the m and coordinates. Then I had to use the point slope formula but I didn't use it.

#5a

if $a = 0$ then it would lie on the y-axis, if the $b = 0$ then it would lie on the x-axis, so false.

Reason: I thought that this means $(0,0)$ so I was thinking it was the origin but I had to think about each one differently.

#5c

The slope is actually defined because the y would be part of $y = mx + b$

Reason: I got this wrong because I thought it was just a line at first but I was wrong