Algebra Unit 0-Back to Basics Review Day 5 Notes
Solving One and Two Step Equations (PH Lessons 1-8, 2-1, and 2-2)

Name $\qquad$
Date $\qquad$ Hour $\qquad$

Review of Properties of Real Numbers: Let $a, b$, and $c$ represent real numbers.

| Property | Addition | Multiplication |
| :---: | :---: | :---: |
| Closure | $a+b$ is a real number | ab is a real number |
| Commutative | $\mathbf{a + b}=\mathbf{b + a}$ | $\mathbf{a b}=\mathbf{b a}$ |
| Associative | $(a+b)+c=a+(b+c)$ | (ab)c = a(bc) |
| Identity | $a+0=a, 0+a=a$ | $a \cdot 1=a, 1 \cdot a=a$ |
| Inverse | $a+(-a)=0$ | $a \cdot \frac{1}{a}=1, a \neq 0$ |


| Other Properties |  |
| :--- | :---: |
| Distributive | $\mathrm{a}(\mathrm{b}+\mathrm{c})=\mathrm{ab}+\mathrm{ac}$ |
| Multiplication Property of Zero | $\mathrm{a} \cdot 0=0$ |
| Multiplication Property of -1 | $-\mathrm{a}=-1 \cdot \mathrm{a}$ |

Example 1: State a reason for each step.
a. $4 c+3(2+c)=4 c+6+3 c$
b.

$$
=4 c+3 c+6
$$

c. $\quad=(4 c+3 c)+6$ $\qquad$
d. $\quad=(4+3) c+6$
e. $\quad=7 c+6$

An equation is like a balance scale because it shows that two quantities are equal. Scales remain balanced when the same weight is added to each side.

Similarly, the scales remain balanced when the same weight is taken away from each side. This demonstrates how the addition and subtraction properties of equality work with equations.

Addition Property of Equality

Subtraction Property of Equality

For every real number $a, b$, and $c$, if $a=b$, then $a+c=b+c$

For every real number $a, b$, and $c$, if $a=b$, then $a-c=b-c$
Example 2: Solve.
a. $x+5=-12$
b. $x-3=17$

Multiplication Property of Equality

## Division Property of Equality

For every real number $a, b$, and $c$, if $a=b$, then $a \cdot c=b \cdot c$

For every real number $a, b$, and $c$, with $c \neq 0$, if $\boldsymbol{a}=\boldsymbol{b}$, then $\frac{a}{c}=\frac{b}{c}$

Example 3: Solve each one-step equation.
a. $-3 p=12$
b. $-\frac{n}{6}=5$

Example 4: Solve each equation.
a. $-\frac{1}{4} m=8$
b. $\frac{8}{15}=\frac{2}{5} x$

## SOLVING TWO-STEP EQUATIONS

Step I Use the Addition or Subtraction Property of Equality to get the variable term alone on one side.
Step 2 Use the Multiplication or Division Property of Equality to solve.
Example 5: Solve each two-step equation.
a. $6 a+2=-4$
b. $7=2 y-3$

Example 6: Solve each equation. Remember that $-\mathbf{x}=-1 \cdot x$
a. $-x+7=12$
b. $6-b=-11$

