Math 8 6.1 Solving Equations Using Models

Name _____
Blk _____

Equation: a math statement where two Equal sides R separated by an = (equal) sign

$3+6=9 \rightarrow 9=9$ (true ✓)
: result of an equation is a true statement

Algebra [Solving for x]
↳ named in 800 C.E. by al-Khwarizmi from Arabic word al-jabr meaning to 'restore'

→ 3 times a number, plus seven more is 22
(N) + 7 = 22

→ rewrite the words into an Algebraic Equation
$3 \cdot N + 7 = 22$

1) Let N be the number
2) $3N+7=22$
* 3) Solve for N

↗ start +/- terms
→ then ×/÷ terms
↘ do the opposite

$3N + 7 = 22$
terms

$3N + 7 \quad \vdots \quad 22$
$-7 \quad \vdots \quad -7$
$3N + \emptyset = 15$
$\div 3 \qquad \div 3$
$1N = 5$

→ To keep an equation balanced you MUST do the 'math action' to both sides

$$\begin{array}{rcl} 3\cdot 6 & \stackrel{?}{=} & 18 \\ \div 3 & & \div 3 \\ \hline 1\cdot 6 & \stackrel{?}{=} & 6 \end{array}$$ (true ✓)

Goal: Isolate the variable (letter standing in for a #)

HW: A: 7, 11 B: 8, 9, 13 C: 14, 17

Steps

1) reduce +/- terms to zero by doing the opposite action $+7-7=0$, $-4+4=0$
2) reduce ×/÷ terms to one by doing the opposite action $3\div 3=1$, $\frac{1}{3}\times 3=1$ ✱

✱ MUST treat +/- terms first!!!! [if there are any]

Ex 1: $3w \stackrel{?}{=} 42$

$\div 3 \quad \div 3$

$1w = 14$

Goal: isolate w
1) +/- terms → none
2) ×/÷ terms

Ex 2: $3w - 5 \stackrel{?}{=} 19$

$+5 \quad +5$

$3w = 24$

$\div 3 \quad \div 3$

$1w = 8$

Goal: isolate w
1) +/- terms $-5+5=0$
2) ×/÷ terms $3w\div 3=1w$

Ex 3: $8 \stackrel{?}{=} -6 - 2x$

$+6 \quad +6$

$14 = -2x$

$\div -2 \quad \div -2$

$-7 = 1x$