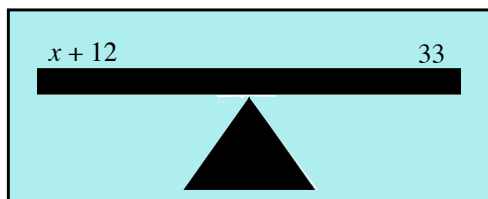


7th Grade Investigation 7

- I can use a balance scale to model an equation.
- I can solve and check equations that involve addition.
- I can solve and check equations that involve multiplication.

Equations are sometimes called balanced
equations because the two sides of
the equation "balance" each other.



Whatever operation we perform on one
side of an equation, we also perform
on the other side of the equation
to maintain a balanced equation.

Two Steps to Solve an Equation

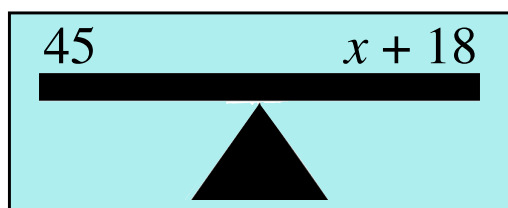
Step 1: select the operation that will isolate the variable

$x+2 \Rightarrow$ subtract 2
 $3x \Rightarrow$ divide by 3
 $\frac{2}{3}x \Rightarrow$ multiply by $\frac{3}{2}$

Step 2: perform the selected operation on both sides of the equation

$x+12=33$	
-12	-12 subt. 12
$x=21$	

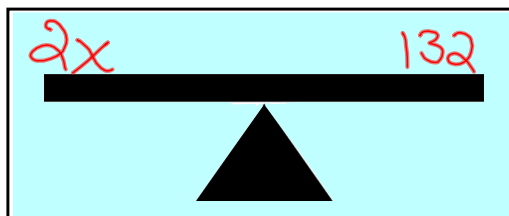
$\checkmark 21+12 \stackrel{?}{=} 33$
 $33=33$
 T



45	$x+18$	
-18	-18	subt. 18
27	x	

$\checkmark 45 \stackrel{?}{=} 27+18$
 $45=45$
 T

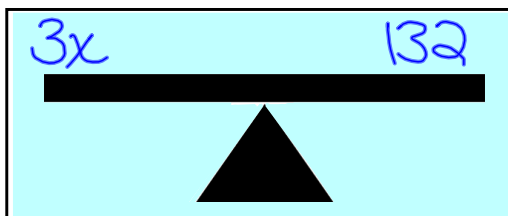
$$2x = 132$$



$$\begin{array}{r|l} \cancel{2}x & = & \cancel{1}32 \\ \hline x & = & 66 \end{array} \quad \leftarrow \text{divide by 2}$$

$$\begin{array}{l} \checkmark 2 \cdot 66 = 132 \\ 132 = 132 \\ \text{T} \end{array}$$

Draw a balance-scale model for the equation $3x = 132$.



Write the line-by-line solution of the equation.

$$\begin{array}{r|l} 3x & = & 132 \\ \hline x & = & 44 \end{array} \quad \text{divide by 3}$$

$$\begin{array}{l} \checkmark 3 \cdot 44 = 132 \\ 132 = 132 \\ \text{T} \end{array}$$

The number that multiplies the variable in an algebraic term is called the coefficient.

$$\boxed{3}x = 132$$

coefficient

$$\frac{\cancel{4}^3 \cdot \frac{3}{4}x}{x} = \frac{\frac{9^3 \cdot \cancel{4}^2}{10 \cdot 5} \cdot \cancel{4}^2}{\cancel{5}^1}$$

multiply by $\frac{4}{3}$

$$\checkmark \frac{\cancel{4}^3 \cdot 3 \cdot 6}{\cancel{2} \cdot 5} = \frac{9}{10}$$

$$\frac{9}{10} = \frac{9}{10}$$

$$\begin{array}{r|l} x + 2.5 & = 7 \\ -2.5 & \quad 2.5 \text{ subt.} \\ \hline x & = 4.5 \end{array}$$

$$\checkmark 4.5 + 2.5 \stackrel{?}{=} 7$$

$$7 = 7$$

$$\begin{array}{r|l} 3.6 & = y + 2 \\ -2 & \quad -2 \text{ subt.} \\ \hline 1.6 & = y \end{array}$$

$$\checkmark 3.6 \stackrel{?}{=} 1.6 + 2$$

$$3.6 = 3.6$$

***the rest of the packet is the assignment.

$$\begin{array}{r|l} \frac{4w}{4} = & \frac{132}{4} \\ \hline w = & 33 \end{array} \quad \text{divide by 4}$$

$$1.2m = 1.32$$

$$x + \frac{3}{4} = \frac{5}{6}$$

$$\frac{3}{4}x = \frac{5}{6}$$

Make up an addition equation with decimal numbers. Solve and check it.

Make up a multiplication equation with a fractional coefficient. Solve and check it.

