Lesson 1.1:

Solving Simple Equations

Essential Question

How can you use inductive reasoning to discover rules in mathematics? How can you test a rule?



Addition Property of Equality

Words Adding the same number to each side of an equation produces an equivalent equation.

Algebra If a = b, then a + c = b + c.

Subtraction Property of Equality

Words Subtracting the same number from each side of an equation produces an equivalent equation.

Algebra If a = b, then a - c = b - c.

The GOLDEN RULE!!!

a. Solve
$$x - 7 = -6$$
.

b. Solve
$$y + 3.4 \neq 0.5$$
.

-34434

-2.9

2.9

c. Solve
$$h + 2\pi = 3\pi$$
.

 -2π
 -2π

Solve the equation. Check your solution.

Solve the equation. Check your solution.

5.
$$t - \frac{1}{4} = -\frac{3}{4}$$

$$+ \frac{1}{4} + \frac{1}{4}$$

$$+ \frac{1}{4} + \frac{1}{4}$$

$$2\pi - \pi = \pi \sqrt{\frac{1}{2} + \frac{1}{4} = -\frac{3}{4}} \sqrt{\frac{1}{4}}$$



Multiplication Property of Equality

Words Multiplying each side of an equation by the same number produces an equivalent equation.

Algebra If a = b, then $a \cdot c = b \cdot c$.

Division Property of Equality

Words Dividing each side of an equation by the same number produces an equivalent equation.

Algebra If a = b, then $a \div c = b \div c$, $c \ne 0$.

The GOLDEN RULE!!!

a. Solve
$$-\frac{3}{4}n \neq -2$$
 Remember! You can fraction or multiply by (Keep-Change-Flip)
$$1 - \frac{3}{4} \cdot (-\frac{1}{4}) \cdot (-\frac{1}{4}) = -\frac{1}{4} \cdot (-\frac{1}{4}) = -\frac{1}{4$$

Remember! You can either divide a fraction or multiply by its reciprocal.

b. Solve
$$\pi x = 3\pi$$

$$\begin{array}{c}
\vdots & \uparrow & \uparrow \\
 & \uparrow & \uparrow \\
 & \downarrow & \uparrow & \\
 & \downarrow & \uparrow & \uparrow
\end{array}$$

Solve the equation. Check your solution.

7.
$$\frac{y}{4} = -7$$
• 4 • 4
 $y = -28$

$$\frac{-28}{4} = -7$$

$$\frac{1.8}{90} = \frac{180}{9} = 20$$

What value of k makes the equation $k + 4 \div 0.2 = 5$ true?

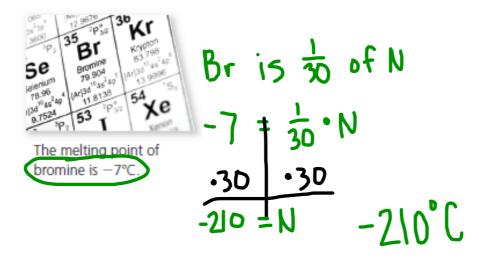
$$K + 4 \div 0.2 = 5$$

$$\frac{40}{0.2} = \frac{40}{2} \cdot 20 \quad k + 20 \quad f = 5$$

$$-20 \quad -20$$

$$K = -15$$

The *melting point* of a solid is the temperature at which the solid becomes a liquid. The melting point of bromine is $\frac{1}{30}$ of the melting point of nitrogen. Write and solve an equation to find the melting point of nitrogen.



10. Solve
$$p + 8 \div \frac{1}{2} = -3$$

$$p + (-16) = -3$$

$$-(-16) + (-16)$$

11. Solve
$$q + |-10| = 2$$

$$q + |0| + 2$$

$$- |0| - |0|$$

12. The melting point of mercury is about $\frac{1}{4}$ of the melting point of krypton. The melting point of mercury is -39° C. Write and solve an equation to find the melting point of krypton.

$$M = \frac{1}{4} \cdot K$$

$$-39 = \frac{1}{4} k$$

$$-4 \cdot 4$$

$$-156 = K$$

$$156$$