Solving Equations

Property/Justification Word Bank

Commutative Property
Identity Property

Associative Property
Combining Like Terms

Distributive Property
Inverse Property

Properties of Equality

Addition Property of Equality

Multiplication Property of Equality

Subtraction Property of Equality Division Property of Equality

Equation:

$$10x - 2x - 3 = 3(2x + 3)$$

$$8x-3 = 3(2x+3)$$

$$8x-3 = 6x+9$$

$$-6x -6x$$

$$2x-3 = 0 + 9$$

$$2x-3 = 9$$

$$+3 +3$$

$$2x - 0 = 12$$

$$2x = 12$$

Justification

Some tougher ones...

$$1. \qquad \frac{x}{-4} = 5$$

$$2. \qquad -\frac{x}{4} = 5$$

$$3. \qquad \frac{-x}{4} = 5$$

$$4. \qquad \frac{2x}{5} = 2$$

$$5. \qquad \frac{2}{5}x = 2$$

$$6. \qquad \frac{2}{5x} = 2$$

Fractional Equations

We can solve Fractional Equations several different ways. Here are three common ways.

1. Calculator Plug and Chug

$$\frac{3}{4}x - 7 = 6.5$$

Use the Calculator strategy to solve this problem

$$\frac{x}{3} + \frac{x+1}{2} = x$$

2. Proportion

$$\frac{x-1}{4} = \frac{x}{5}$$

Use the <u>Calculator</u> strategy to solve this problem

$$\frac{x}{3} + \frac{x+1}{2} = x$$

3. Common Denominators

$$\frac{3}{5}(x+2) = x-4$$

Use the Calculator strategy to solve this problem

$$\frac{x}{3} + \frac{x+1}{2} = x$$

Homework:

$$\frac{x}{5} + \frac{x}{2} = 14$$

$$\frac{3}{4}x + 2 = \frac{5}{4}x - 6$$

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

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Equation: Justification 10x-2x-3 = 3(2x+3)8x-3 = 3(2x+3)- 1. Given = 2. CLT = 3. Distributive Prop 8x-3 = 6x+9-6x - 6x+ 4. Sub. Prop of = + S. Inverse Prop 2x-3 = 0 + 92x - 3 = 94-6. Identily Prop +3 + 3< 7. Add Prop of 2x - 0 = 126. Inverse Prop. -9. Identity Prop ← 10. ÷ Prop of = 11. Identity Prop

Some tougher ones...

1.
$$\frac{x}{-4} = 5$$

$$2. \qquad -\frac{x}{4} = 5$$

$$\boxed{\chi = -20}$$

$$3. -\frac{-x}{4} = 5$$

$$-x \cdot 20$$

$$X = -20$$

$$\frac{2}{5}x = 2$$

$$\div \frac{2}{5} \div \frac{2}{5}$$

$$X = 5$$

6.
$$\frac{2}{5x} = 2 \cdot 5 \times$$

$$\frac{2}{10} = \frac{10}{10} \times$$

$$\frac{1}{5} = \times$$

Fractional Equations

We can solve Fractional Equations several different ways. Here are three common ways.

1. Calculator Plug and Chug

$$\frac{\frac{3}{4}x - 7 = 6.5}{+7 + 7}$$

$$\frac{4}{3} \cdot \frac{3}{4}x = 13.5 \cdot \frac{4}{3}$$

$$\chi = 18$$

Use the Calculator strategy to solve this problem

$$\frac{|x|}{3} + \frac{|(x+1)|}{2} = x$$

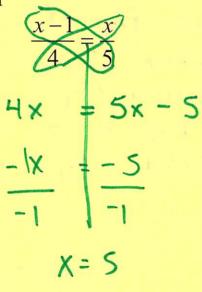
$$\frac{1}{3} \times + \frac{1}{2}(x+1) = x$$

$$\frac{1}{3} \times + \frac{1}{2} \times + \frac{1}{2} = x$$

$$\frac{5}{6} \times + \frac{1}{2} = x$$

$$\frac{5}{6} \times + \frac{1}{2} = x$$
The the Maleulator strategy to solve this problem are the Maleulator strategy to solve this problem.

2. Proportion



$$\frac{2}{2} \cdot \left(\frac{x}{3}\right) + \left(\frac{x+1}{2}\right) = \frac{3}{3}$$

CD:6

$$\frac{2x}{6} + \frac{3x+3}{6} = \frac{x}{1}$$

$$\frac{5 \times +3}{6} = \frac{x}{1}$$

$$6 \times = 5 \times +3$$

$$-5 \times = -5 \times$$

3. Common Denominators

$$\frac{3}{5}(x+2) = x-4$$

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

$$\frac{5}{1} \left(\frac{3 \times + 6}{5} \right) = \left(\frac{5 \times - 20}{5} \right) = \frac{5}{1}$$

Use the Calculator strategy to solve this problem

$$\frac{2}{2} \cdot \left(\frac{x}{3}\right) \left(\frac{x+1}{2}\right) \frac{3}{3} x$$

$$\frac{6}{1}\left(\frac{2x}{6} + \frac{3x+3}{6}\right) = \left(\frac{6x}{6}\right)^{\frac{6}{1}}$$

$$2x + 3x + 3 = 6x$$

$$5x + 3 = 6x$$

$$-5x \qquad -5x$$

$$3 = X$$

Homework: - 2

$$\frac{x}{5} + \frac{x}{2} = 14$$

$$\frac{2}{2} \cdot \frac{x}{5} + \frac{3}{5} \cdot \frac{x}{2}$$

$$\frac{2x}{10} + \frac{5x}{16} = \frac{14}{1}$$

$$\frac{3x}{10} = \frac{14}{1}$$
 $\frac{140 = 7x}{7}$

$$\frac{3}{4}x + 2 = \frac{5}{4}x - 6$$

$$\frac{4}{1}\left(\frac{3}{4} + \frac{8}{4}\right) = \left(\frac{5}{4} - \frac{24}{4}\right) = \frac{1}{1}$$

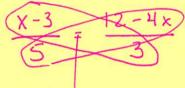
$$3x + 8 \neq 5x - 24$$

 $-3x$
 $8 = 2x - 24$

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

$$\frac{x-3}{5} = \frac{4}{1} - \frac{4x}{3}$$

$$\frac{x-3}{5} = \frac{12}{3} - \frac{4x}{3}$$



$$3x-9 = 60 - 20x$$

 $-3x$
 $-9 = 40 - 23x$
 $-60 = 40$

$$\frac{-23}{3} - 28$$