Name Classwork Answers Pd_____ Date _____

Solving Equations with Fractions - FRACTION BUSTING

Warm Up (be prepared to explain your answers)

multiply by the reciprocal

rewrite 10 as $\frac{10}{1}$

1. a. Add: $\frac{5}{5}\cdot\frac{1}{3}+\frac{1}{5}\cdot\frac{3}{3}$ LC

$\frac{5}{15}+\frac{3}{15}=\frac{8}{15}$

b. Multiply: $\frac{5}{1}\cdot\frac{1}{5}=\frac{5}{5}=1$

c. Multiply: $\frac{10}{1}\cdot\frac{4}{5}=\frac{40}{5}=8$

2. Solve for x:

a. $\frac{6}{1}\cdot\frac{1x}{6}=12\cdot 6$

$\frac{6x}{6}=72$

$x=72$

b. $\frac{3}{1}\cdot\frac{2x}{3}=14\cdot 3$

$\frac{2x}{2}=\frac{42}{2}$

$x=21$

c. $\frac{3}{2}\cdot\frac{2}{3}x=\frac{14}{1}\cdot\frac{3}{2}$

$x=\frac{42}{2}$

$x=21$

5-12. Answer the questions below about the equation $\frac{x}{3}+\frac{x}{5}=16$.

a. Multiply each side of the equation by 3 (you will have to distribute on the left side). What happened? Do any fractions remain?

yes, the $\frac{3x}{5}$ remains

$\frac{3}{1}\cdot\left(\frac{x}{3}+\frac{x}{5}\right)=(16)\cdot 3$

$\frac{3x}{3}+\frac{3x}{5}=48$

$x+\frac{3x}{5}=48$

b. If you had multiplied both sides of the original equation by 5 instead of 3, would you have eliminated all of the fractions?

No $\frac{5x}{3}$ remains

$\frac{5}{1}\cdot\left(\frac{x}{3}+\frac{x}{5}\right)=16\cdot 5$

$\frac{5x}{3}+\frac{5x}{5}=80$

$\frac{5x}{3}+x=80$

c. Find a number that you can use to multiply by all of the terms that will get rid of all of the fractions. How is this number related to the numbers in the equation?

15: Because 3 and 5 are factors of 15

$\frac{15}{1}\left(\frac{x}{3}+\frac{x}{5}\right)=16\cdot 15$

$\frac{15x}{3}+\frac{15x}{5}=240$

$5x+3x=240$

d. Solve your new equation from part (c) and check your solution.

$5x+3x=240$

$8x=240$

$\frac{8x}{8}=\frac{240}{8}$

$x=30$

e. To "BUST" (get rid of the fractions), multiply both sides of the equation by the Least Common Multiple LCM.

f. Fill in each of the lines labeled (a) through (e) to explain how the equation to its left was obtained from the equation above it.

Solving Steps	Explanation
$\frac{4x}{3}+\frac{3x}{2}=\frac{17}{6}$	Original equation - what number should you multiply both sides by? 6
$6\left(\frac{4x}{3}+\frac{3x}{2}\right)=6\left(\frac{17}{6}\right)$	a. Distribute 6
$6\left(\frac{4x}{3}\right)+6\left(\frac{3x}{2}\right)=6\left(\frac{17}{6}\right)$	b. Multiply 6 to every term
8x + 9x = 17	c. Combine like terms
17x = 17	d. Divide 17 to both sides
x = 1	e. Solve

Solve using the fraction buster method:

g. $\frac{x}{5}+3=10$

LCM: 5

$-3 \quad -3$

$\frac{5}{1}\left(\frac{x}{5}\right)=(7)\cdot 5$

$\frac{5x}{5}=35$

$x=35$

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

LCM: 4

$-5 \quad -5$

$\frac{4}{1}\cdot\left(\frac{3x-2}{4}\right)=(-8)\cdot 4$

$3x-2=-32$

$+2 \quad +2$

$\frac{3x}{3}=\frac{-30}{3}$

$x=-10$

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

LCM: 20

$\frac{20}{1}\cdot\left(\frac{x-4}{4}\right)+\frac{20^{4}}{1}\cdot\left(\frac{2x-2}{5}\right)=60$

$5(x-4)+4(2x-2)=60$

$5x-20+8x-8=60$

$13x-28=60$

$+28 \quad +28$

$\frac{13x}{13}=\frac{88}{13}$

$x=\frac{88}{13}$ or $6\frac{10}{13}$

j. $\frac{4x+1}{3}+\frac{5}{6}=\frac{7x+1}{8}$

LCM: 24

$\frac{24}{1}\left(\frac{4x+1}{3}\right)+\frac{24}{1}\left(\frac{5}{6}\right)=\left(\frac{7x+1}{8}\right)\cdot\frac{24}{1}$

$8(4x+1)+4(5)=(7x+1)\cdot 3$

$32x+8+20=21x+3$

$32x+28=21x+3$

$-21x \quad -21x$

$11x+28=3$

$-28 \quad -28$

$\frac{11x}{11}=\frac{-25}{11}$

$x=-2\frac{4}{11}$