

Algebra 1:

Working with Fractions.

In 1.4 we briefly talked about getting rid of fractions. We multiplied by the reciprocal to get rid of numbers.

Warmup:

1. The reciprocal of $-\frac{7}{8}$ is $-\frac{8}{7}$

2. Solve for x by multiplying by the reciprocal.

This will cancel
 $\frac{10}{10} = 1$

$$\frac{5}{2} \cdot \frac{2}{5} x = \frac{10}{1} \cdot \frac{5}{2}$$

multiply straight across

$$x = \frac{50}{2}$$

simplify.

$$x = 25$$

Ex: Solve $-\frac{4}{3}x = 8 \cdot -\frac{3}{4}$

$x =$

3 Methods from here...

Reducing First

$x = \frac{2}{1} \cdot -\frac{3}{4}$ $\frac{8}{4} = \frac{2}{1}$

Now multiply across $x = -\frac{6}{1} = -6$

Reducing Last

$x = \frac{8}{1} \cdot -\frac{3}{4}$

$x = \frac{-24}{4} = -6$

Calculator $x = 8 \cdot -\frac{3}{4}$ (on calculator) $x = -6$

Now try #1 on your worksheet.

Moving things around.

These two problems are mechanically identical. Don't let the fractions slow you down or upset you!

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| <p style="text-align: center;">Solve</p> $17 = -8 + 5x$ <p style="margin-left: 20px;">$+8 \quad +8$</p> $\frac{25}{5} = \frac{5x}{5}$ $x = 5$ | <p style="color: red;">← step 1 add →</p> <p style="color: red;">← step 2 divide →</p> | <p style="text-align: center;">Solve</p> $\frac{1}{5} = -\frac{11}{5} + \frac{2}{5}x$ <p style="margin-left: 20px;">$+\frac{11}{5} \quad +\frac{11}{5}$</p> $\frac{12}{5} = \frac{2}{5}x$ <p style="margin-left: 20px;">$\frac{12}{5} \cdot \frac{5}{2} = \frac{2}{5}x \cdot \frac{5}{2}$</p> <p style="margin-left: 20px;">$x = 6$</p> <p style="margin-left: 20px; color: red;">calculator</p> <p style="margin-left: 20px; color: blue;">or ...</p> $\frac{12}{5} = \frac{2}{5}x \cdot \frac{5}{2}$ <p style="margin-left: 20px;">$x = 6$</p> <p style="margin-left: 20px; color: blue;">This is the same as multiplying by the reciprocal!</p> |
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Now try #3 on your worksheet.

Even if the numbers you're adding and subtracting Don't have common demominators, it's not a problem! Just use your calculator! (remember to convert back to a fraction if you get a decimal)

Solve $\frac{1}{4} - \frac{5}{3}x = -\frac{8}{3}$

$$-\frac{1}{4} \cdot -\frac{5}{3}x = -\frac{1}{4} \cdot -\frac{8}{3}$$

$$-\frac{3}{5} \cdot -\frac{5}{3}x = -\frac{35}{12} \cdot -\frac{2}{5}$$

$x = \frac{7}{4}$

Now try #5 on your worksheet.

Fractions are just numbers! Anything you'd do with whole numbers you'd do with fractions when solving.

$$\text{Solve } -\frac{1}{2} \left(\frac{1}{3} + \frac{2}{7}x \right) - \frac{1}{5} = \frac{2}{5}$$

$+\frac{1}{5}$ $+\frac{1}{5}$

$$-\frac{1}{2} \left(\frac{1}{3} + \frac{2}{7}x \right) = \frac{8}{5}$$

or
multiply by reciprocal.

Distributive

$$-\frac{1}{2} \left(\frac{1}{3} + \frac{2}{7}x \right) = \frac{8}{5}$$

$$-\frac{1}{6} - \frac{2}{14}x = \frac{8}{5}$$

$+\frac{1}{6}$ $+\frac{1}{6}$

$$\cancel{-\frac{2}{2}} \cdot -\frac{1}{2} \left(\frac{1}{3} + \frac{2}{7}x \right) = \frac{8}{5} \cdot \frac{2}{2}$$

$$\frac{1}{3} + \frac{2}{7}x = -\frac{16}{5}$$

$-\frac{1}{3}$ $-\frac{1}{3}$

$$\cancel{\frac{7}{2}} \cdot \frac{2}{7}x = -\frac{53}{15} \cdot \frac{7}{2}$$

$$\cancel{-\frac{14}{2}} \cdot \cancel{-\frac{2}{14}}x = \frac{53}{30} \cdot \frac{-14}{2}$$

$$x = -\frac{371}{30}$$

← same! → $x = -\frac{371}{30}$

Now try #7 on your worksheet.

Homework:

Finish your worksheet