8 Adding and Subtracting Fractions

October 23, 2019   9:53 PM

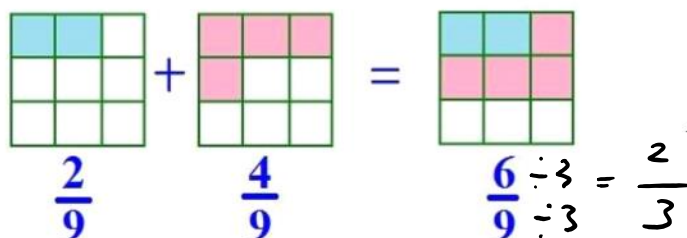Math 9   Name: _____

Adding and Subtracting Fractions (3.2 and 3.3)

Remember The greatest force wins!

Example 1.

$$\frac{2}{9} + \frac{4}{9} = \frac{6}{9} \begin{smallmatrix}\div 3 \\ \div 3\end{smallmatrix} = \frac{2}{3}$$

You NEED a **common denominator**

a) $\frac{2}{5} + \frac{1}{5} = \frac{3}{5}$

b) $\frac{5}{8} + \left(-\frac{3}{8}\right) = \frac{2}{8} = \frac{1}{4}$

$$\frac{5 + (-3)}{8} = \ell$$

c) Bob ate 1/6 of a chocolate bar and Sue ate 3/8 of a chocolate bar, how much chocolate did they eat in total? → addition

$\frac{1}{6} + \frac{3}{8}$ Need a Lowest Common Denominator (LCD)

$\frac{1}{6} \times \frac{4}{4} + \frac{3}{8} \times \frac{3}{3}$ Look: multiples of 6: 6, 12, 18, ⓩ④ ...

       "   "   8: 8, 16, ②④ ...

       LCD = 24

$\frac{4}{24} + \frac{9}{24} = \frac{13}{24}$

d) $\frac{1}{4} + \left(-\frac{2}{3}\right)$ $LCD = 12$

$4, 8, \underline{12}, \ldots \quad 3, 6, 9, \underline{12}, \ldots$

$\frac{1}{4} \times \frac{3}{3} + \left(-\frac{2}{3}\right) \times \frac{4}{4}$

$= \frac{3}{12} + \left(\frac{-8}{12}\right) \quad = \frac{-5}{12}$

d) $\left(-4\frac{1}{5}\right) + \left(5\frac{2}{7}\right)$

Convert to improper fractions!

$\left(-\frac{21}{5}\right) \times \frac{7}{7} + \frac{37}{7} \times \frac{5}{5} \quad LCD = 35$

$-\frac{147}{35} + \frac{185}{35} = \boxed{\frac{38}{35}}$

$\begin{array}{r} 21 \\ \times\, 7 \\ \hline 147 \end{array} \qquad \begin{array}{r} 37 \\ \times\, 5 \\ \hline 185 \end{array} \qquad \begin{array}{r} 185 \\ -147 \\ \hline 38 \end{array}$

Subtraction: Subtraction means a<u>dd</u> the o<u>pposite</u>!

Example 2: Review subtraction

a) $(-3) \ominus (\oplus 4) = (-3) + 4 = 1$

c) $(-5) - 7 = (-5) + (-7) = -12$

b) $5 - (7) = 5 + (-7) = -2$

d) $4 - (-9) = 4 + 9 = 13$

Example 3.

a) $\frac{1}{4} - \left(-\frac{2}{3}\right)$ $LCD = 12$

$\frac{1}{4} \times \frac{3}{3} + \frac{2}{3} \times \frac{4}{4}$

$\frac{3}{12} + \frac{8}{12}$

$\boxed{\frac{11}{12}}$

b) $\left(-\frac{5}{8}\right) - \left(-\frac{2}{3}\right)$ $LCD = 24$

$\left(\frac{-5}{8}\right) \times \frac{3}{3} + \frac{2}{3} \times \frac{8}{8}$

$\frac{-15}{24} + \frac{16}{24}$

$\boxed{\frac{1}{24}}$

2

c)

$$\left(-4\tfrac{1}{5}\right) - \left(5\tfrac{2}{7}\right)$$

$$\left(\frac{-21}{5}\right)^{\times 7}_{7} + \left(-\frac{37}{7}\right)^{\times 5}_{5} \qquad LCD = 35$$

$$= \frac{-147}{35} + \frac{-185}{35}$$

$$= \frac{-332}{35}$$

$$= -9\,\frac{17}{35}$$

Side work:

$$\overset{3}{37} \times 5 = 185$$

$$147 + 185 = 332$$

Another Way: Boom! Boom! Pow! Reduce!

$$\frac{1}{2} + \frac{3}{4} \Rightarrow \frac{1}{2} \times \frac{3}{4} \Rightarrow \frac{1(4) + 3(2)}{2(4)}$$

$$\Rightarrow \frac{4+6}{8} \Rightarrow \frac{10}{8} \Rightarrow \boxed{\frac{5}{4}}$$

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Assignment:

- "How could Goldilocks…" Worksheet

- Did you hear about….?" Worksheet

- ⭐⭐⭐ Sec. 3.2, p. 113 #20 and Sec. 3.3, p. 120 #15bdf

3