Developing Mathematics Through Applications

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Operations with Fractions

Date _____ Period _____

Explain how to do each problem. (You may need to do the problem in order to explain it.) What do you need to remember about each operation with fractions?

$\frac{3}{5}+\frac{7}{15}$

① LCD
② Add only numerators
③ Simplify

$3\cdot\frac{3}{5}+\frac{7}{15}$

$\frac{9}{15}+\frac{7}{15}=\boxed{\frac{16}{15}}$

$\frac{3}{5}-\frac{7}{15}$

① LCD
② Subtract only numerators
③ Simplify

$3\cdot\frac{3}{5}-\frac{7}{15}$

$\frac{9}{15}-\frac{7}{15}=\boxed{\frac{2}{15}}$

$\frac{3}{5}\cdot\frac{7}{15}$

① multiply straight across
② simplify

OR

① simplify across
② multiply straight across

$\frac{3}{5}\cdot\frac{7}{15}=\frac{21}{75}\div 3=\boxed{\frac{7}{25}}$

$\frac{\cancel{3}^{1}}{5}\cdot\frac{7}{\cancel{15}_{5}}=\boxed{\frac{7}{25}}$

$\frac{3}{5}\div\frac{7}{15}$

① Keep
Flip
Change
② multiply/simplify

$\frac{3}{\cancel{5}_{1}}\cdot\frac{\cancel{15}^{3}}{7}=\boxed{\frac{9}{7}}$

$\frac{2}{3}+\left(\frac{4}{5}-\frac{3}{2}\right)$

$\frac{2}{3}+\left(\frac{8}{10}-\frac{15}{10}\right)$

$\frac{2}{3}+\left(\frac{-7}{10}\right)$

$\frac{20}{30}+\frac{-21}{30}$

$\boxed{\frac{-1}{30}}$

$\frac{4}{5}\left(\frac{10}{3}\right)-\frac{1}{2}$

$\frac{40\div 5}{15\div 5}-\frac{1}{2}$

$\frac{2\cdot 8}{2\cdot 3}-\frac{1}{2}\cdot\frac{3}{3}$

$\frac{16}{6}-\frac{3}{6}$

$\boxed{\frac{13}{6}}$

$\frac{2}{3}\div\frac{2}{5}-\left(\frac{3}{4}\cdot\frac{3}{3}+\frac{1}{3}\cdot\frac{4}{4}\right)$

$\frac{2}{3}\div\frac{2}{5}-\left(\frac{9}{12}+\frac{4}{12}\right)$

$\frac{2}{3}\div\frac{2}{5}-\left(\frac{13}{12}\right)$

$\frac{2}{3}\cdot\frac{5}{2}-\frac{13}{12}$

$\frac{4\cdot 5}{4\cdot 3}-\frac{13}{12}$

$\frac{20}{12}-\frac{13}{12}$

$\boxed{\frac{7}{12}}$

$\frac{5}{6}-\frac{7}{12}\div\frac{2}{3}\cdot\left(\frac{4}{3}\right)$

$\frac{5}{6}-\frac{7}{4\cancel{12}}\cdot\frac{13}{2}\cdot\left(\frac{4}{3}\right)$

$\frac{5}{6}-\frac{7}{2\cancel{8}}\cdot\frac{14}{3}$

$\frac{5}{6}-\frac{7}{6}$

$\frac{-2}{6}$

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

Perform the indicated operation and simplify.

1.) $12-\left[3+4\left(\frac{3}{2}\right)\div\frac{2}{5}\right]+2$

$\left[3+\frac{2}{1}\cancel{4}\left(\frac{3}{2}\right)\div\frac{2}{5}\right]$

$\left[3+\frac{6}{1}\div\frac{2}{5}\right]$

$\left[3+\frac{3}{1}\cancel{6}\cdot\frac{5}{2}\right]$

$\left[3+\frac{15}{1}\right]$

$12-[18]+2=$ **-4**

2.) $\frac{5}{6}\div\frac{3}{4}-2\left(3-\frac{2}{3}\right)$

$\left(\frac{3}{1}-\frac{2}{3}\right)=\frac{9}{3}-\frac{2}{3}=\frac{7}{3}$

$\frac{5}{6}\div\frac{3}{4}-2\left(\frac{7}{3}\right)$

$\frac{5}{\cancel{6}_3}\cdot\frac{\cancel{4}^2}{3}-2\left(\frac{7}{3}\right)$

$\frac{10}{9}-\frac{2}{1}\left(\frac{7}{3}\right)$

$\frac{10}{9}-\frac{14}{3}=\frac{10}{9}-\frac{42}{9}=$ **$\frac{-32}{9}$**

3.) $2-\left(\frac{3}{4}\right)\left(\frac{4}{5}\right)+\left(\frac{3}{4}-\frac{4}{3}\right)$

$\left(\frac{9}{12}-\frac{16}{12}\right)$

$2-\left(\frac{3}{\cancel{4}_1}\right)\left(\frac{\cancel{4}^1}{5}\right)+\left(-\frac{7}{12}\right)$

$\frac{2}{1}-\frac{3}{5}+-\frac{7}{12}$

$\frac{120}{60}-\frac{36}{60}+-\frac{35}{60}=$ **$\frac{49}{60}$**

4.) $\left(\frac{5}{8}-\frac{2}{3}\right)\div\left(\frac{5}{6}+\frac{2}{12}\right)$

$\left(\frac{15}{24}-\frac{16}{24}\right)$

$\frac{-1}{24}\div\left(\frac{10}{12}+\frac{2}{12}\right)$

$\frac{-1}{24}\div\frac{12}{12}$

$\frac{-1}{24}\div 1=$ **$\frac{-1}{24}$**

5.) $4-2\left[4-3\left(\frac{2}{3}\right)\right]$

$\left[4-\frac{3}{1}\left(\frac{2}{\cancel{3}_1}\right)\right]$

$\left[4-\frac{2}{1}\right]$

$[4-2]$

$4-2[2]$

$4-4=$ **0**

6.) $12\left(\frac{2}{3}-\frac{3}{4}+\frac{1}{6}-\frac{7}{10}\right)$

$\left(\frac{8}{12}-\frac{9}{12}+\frac{1}{6}-\frac{7}{10}\right)$

$\left(-\frac{1}{12}+\frac{2}{12}-\frac{7}{10}\right)$

$\left(\frac{1}{12}-\frac{7}{10}\right)$

$\left(\frac{5}{60}-\frac{42}{60}\right)$

$\frac{\cancel{12}^1}{1}\left(-\frac{37}{\cancel{60}_5}\right)=$ **$\frac{-37}{5}$**

7.) $\frac{3}{7}\div\frac{2}{5}\cdot\frac{1}{2}-\frac{3}{4}$

$\frac{3}{7}\cdot\frac{5}{2}$

$\frac{15}{14}\cdot\frac{1}{2}$

$\frac{15}{28}-\frac{3}{4}$

$\frac{15}{28}-\frac{21}{28}=\frac{-6}{28}=$ **$\frac{-3}{14}$**

8.) $\frac{5}{9}+\frac{1}{12}\div\frac{2}{3}-3$

$\frac{1}{\cancel{12}_4}\cdot\frac{\cancel{3}^1}{2}$

$\frac{5}{9}+\frac{1}{8}-3$

$\frac{40}{72}+\frac{9}{72}$

$\frac{49}{72}-\frac{3}{1}=\frac{49}{72}-\frac{216}{72}=$ **$\frac{-167}{72}$**