Math 60, Section 1.2, 1.4 Notes and Activities

Name: Solutions

Section 1.2: Fractions

1. Multiplying Fractions - What is half of a half?



Try to cross-cancel first. Always simplify!

a. $\frac{1}{2}\cdot\frac{1}{2} = \frac{1}{4}$

b. $\frac{1}{3}\cdot\frac{3}{5} = \frac{3\div 3}{15\div 3} = \frac{1}{5}$

$\frac{1}{3}\cdot\frac{3}{5} = \frac{1}{5}$

c. $2\cdot\frac{1}{8} = \frac{2}{1}\cdot\frac{1}{8} = \frac{1}{4}$

d. $\frac{3}{5}\cdot\frac{7}{6} = \frac{7}{10}$

e. $-5\frac{1}{2}\cdot\frac{4}{3}$

$-\frac{11}{2}\cdot\frac{4}{3} = -\frac{22}{3}$ or $-7\frac{1}{3}$

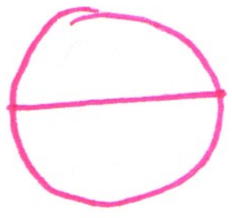
f. $\left(-\frac{3}{8}\right)\cdot\left(-\frac{2}{9}\right) = \frac{1}{12}$

g. $-3\cdot\frac{1}{6} = -\frac{1}{2}$

h. $\left(\frac{3}{5}\right)^2 = \frac{3}{5}\cdot\frac{3}{5} = \frac{9}{25}$

i. $\frac{2}{3}\cdot\frac{5}{4}\cdot\frac{9}{10} = \frac{3}{4}$

2. Dividing Fractions - Dividing by 2 is the same as multiplying by ½ (reciprocal)



$\div 2$ is the same as $\cdot\frac{1}{2}$

$\div\frac{2}{1}$ $\cdot\frac{1}{2}$

a. $-\frac{3}{4}\div\frac{3}{2}$

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

sit · flip

b. $\frac{11}{16}\div\left(-\frac{9}{16}\right)$

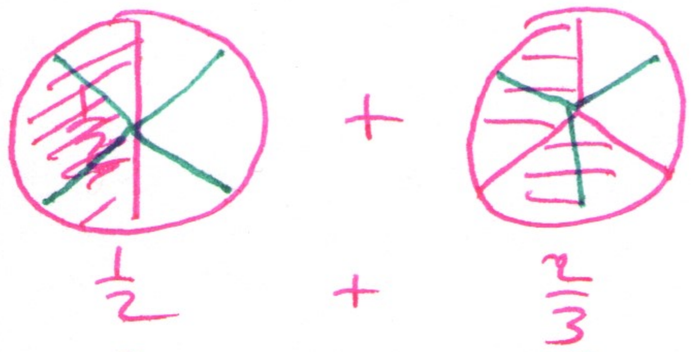
$\frac{11}{16}\cdot\frac{16}{9} = -\frac{11}{9}$

c. $-1\div\frac{1}{4}$

$= -\frac{1}{1}\cdot\frac{4}{1} = -\frac{4}{1} = -4$

d. $-\frac{1}{7}\div\left(-\frac{5}{6}\right) = -\frac{1}{7}\cdot-\frac{6}{5} = \frac{6}{35}$

3. Adding and Subtracting Fractions – We can only add like sized pieces (common denominator).



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

$\frac{3}{6}$ + $\frac{4}{6}$ = $\frac{7}{6}$

a. $\frac{1}{2}+\frac{2}{3}$

$= \frac{3}{6}+\frac{4}{6} = \frac{7}{6}$

b. $\frac{18}{11}-\frac{7}{11} = \frac{11}{11} = 1$

c. $-\frac{3}{8}-\left(-\frac{1}{2}\right) = -\frac{3}{8}+\frac{1}{2}$

$= -\frac{3}{8}+\frac{4}{8} = \frac{1}{8}$

LCD = 24

d. $\frac{3}{8}-\frac{1}{3}$

$= \frac{9}{24}-\frac{8}{24}$

$= \frac{1}{24}$

e. $-2+\frac{5}{7}$

$= \frac{-14}{7}+\frac{5}{7} = -\frac{9}{7}$

f. $\frac{3}{4}-\frac{1}{6}-\frac{7}{3}$

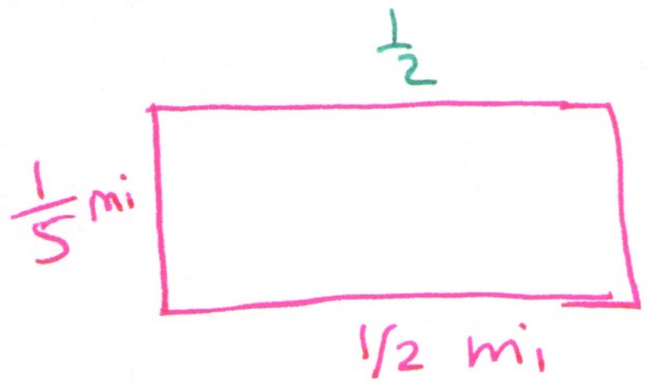
$= \frac{9}{12}+\frac{2}{12}-\frac{28}{12}$

$= \frac{11}{12}-\frac{28}{12}$

$= -\frac{17}{12}$

4. Perimeter – Draw a Picture.

A ~~square~~ rectangular yard is $\frac{1}{5}$ of a mile wide by $\frac{1}{2}$ mile long. How long is the perimeter? Practice with fractions, but then you can use decimals to check!



Perimeter $= \frac{1}{5} + \frac{1}{5} + \frac{1}{2} + \frac{1}{2}$

$= \frac{2.2}{5.2} + \frac{2.5}{2.5}$

$= \frac{4}{10} + \frac{10}{10}$

$= \frac{14}{10}$ miles

$= \frac{7}{5}$ or $1\frac{2}{5}$ miles

We would need $1\frac{2}{5}$ miles of fencing

5. Order of Operations – PEMDAS

P – Parentheses or any grouping symbol ( ), [ ], $\sqrt{\ }$, | |

E – Exponents

MD – Mult + Div from Left to Right

AS – Add + Subtract from Left to Right

a. $3+(-4)\cdot 5$

$= 3-20$

$= -17$

b. $(-40)\div(-4)\cdot 2$ L to R

$= 10\cdot 2$

$= 20$

c. $15-2[5-(-2)]$

$= 15-2[5+2]$

$= 15-2\cdot 7$

$= 15-14$

$= 1$

d. $\dfrac{9\cdot 2+2|-5|}{(-2)^2}$

$= \dfrac{18+2\cdot 5}{4}$

$= \dfrac{18+10}{4}$

$= \dfrac{28}{4}$

$= 7$

e. $3(1-2|3-6|)$

$= 3(1-2|-3|)$

$= 3(1-2\cdot 3)$

$= 3(1-6)$

$= 3(-5)$

$= -15$

f. $\dfrac{22+20\div(-5)}{(-4+7)^2}$

$= \dfrac{22+(-4)}{3^2}$

$= \dfrac{18}{9}$

$= 2$

g. $4(-9)+8\div(-2)-6\cdot 5$

$-36+(-4)-30$

$= -40-30$

$= -70$

h. $3-\sqrt{7(4)+8}$

$= 3-\sqrt{28+8}$

$= 3-\sqrt{36}$

$= 3-6$

$= -3$

6. More Practice

a. $\frac{2}{3}+\frac{3}{4}$ (4, 3)

$= \frac{8}{12} + \frac{9}{12}$

$= \frac{17}{12}$

b. $\frac{2}{3}-\frac{3}{4}$ (4, 3) $= \frac{8}{12} - \frac{9}{12}$

$= \frac{-1}{12}$

c. $\frac{2}{3}\cdot\frac{3}{4} = \frac{1}{2}$

d. $\frac{2}{3}\div\frac{3}{4} = \frac{2}{3}\cdot\frac{4}{3} = \frac{8}{9}$

e. $-\frac{1}{6}-\frac{3}{12}$ (2) $= \frac{-2}{12} - \frac{3}{12}$

$= -\frac{5}{12}$

f. $\left(\frac{2}{3}\right)^2 = \frac{2}{3}\cdot\frac{2}{3} = \frac{4}{9}$

g. $-\frac{7}{8}\div\frac{1}{4} = -\frac{7}{8}\cdot\frac{4}{1} = -\frac{7}{2}$

h. $\frac{9}{16}\cdot\frac{4}{3}\cdot\frac{2}{5} = \frac{3}{10}$

i. $\frac{1}{2}-\frac{3}{4}+\frac{5}{8}$ (4, 2) $= \frac{4}{8} - \frac{6}{8} + \frac{5}{8}$

$= \frac{-2}{8} + \frac{5}{8}$

$= \frac{3}{8}$

j. $-2\frac{3}{8}+\frac{11}{6}$ (+) $= \frac{-19}{8}(3) + \frac{11}{6}(4)$

$= \frac{-57}{24} + \frac{44}{24}$

$= \frac{-13}{24}$

k. $-\frac{6}{1}\cdot\left(\frac{1}{3}\right)$ (2) $= -2$

l. $1\frac{1}{2}\div(-3)$ (+) $= \frac{3}{2}\cdot\frac{-1}{3}$ (1)

$= -\frac{1}{2}$

m. $\frac{2^2-5^2}{(2-5)^2}$ $= \frac{4-25}{(-3)^2}$

$= \frac{-21}{9}$

n. $-6^2-27\div3^2\cdot2-(-1)$

$= -36-27\div9\cdot2+1$

$= -36-3\cdot2+1$

$= -36-6+1$

$= -42+1$

$= -41$

o. Jess walked $\frac{7}{10}$ of a mile in the morning and $\frac{3}{4}$ of a mile in the afternoon. How far did they walk altogether? Show all your steps and write your answer in a complete sentence.

$\frac{7}{10}+\frac{3}{4} = \frac{14}{20}+\frac{15}{20}$

$= \frac{29}{20}$

$= 1\frac{9}{20}$ miles

Jess walked $1\frac{9}{20}$ miles.

p. Carlos is making Polvorones, which are Mexican Wedding Cookies. The recipe calls for $1\frac{1}{4}$ cups of butter and he is making five times the recipe. How much butter does he need?

$1\frac{1}{4}\cdot5 = \frac{5}{4}\cdot5$

$= \frac{25}{4}$

$= 6\frac{1}{4}$ cups

Carlos needs $6\frac{1}{4}$ cups of butter.