Pre-Algebra
Worksheet 4: Fractions II Answers

1. Calculate the following (and express your answers in their lowest terms):

   (a) $\frac{4}{15} + \frac{2}{15}$

   Both denominators are the same - 15 - so you can just add the numerators: $\frac{4}{15} + \frac{2}{15} = \frac{4+2}{15} = \frac{6}{15} = \frac{2}{5}$
   Here, the fraction 6/15 was reduced to its lowest terms by dividing the numerator and the denominator by the highest common factor, 3.

   (b) $\frac{1}{17} + \frac{7}{17} + \frac{9}{17}$

   All three denominators are the same - 17 - so you can just add the numerators: $\frac{1}{17} + \frac{7}{17} + \frac{9}{17} = \frac{1+7+9}{17} = \frac{17}{17} = 1$
   Where you were able to divide the numerator and the denominator by the HCF, 17.

   (c) $\frac{3}{19} - \frac{2}{19}$

   The denominators are the same - 19 - so: $\frac{3}{19} - \frac{2}{19} = \frac{3-2}{19} = \frac{1}{19}$

   (d) $\frac{7}{20} - \frac{2}{20}$

   $\frac{7}{20} - \frac{2}{20} = \frac{7-2}{20} = \frac{5}{20} = \frac{1}{4}$

   where you reduced the fraction to its lowest terms by dividing by the HCF, 5.

   (e) $\frac{1}{41} + \frac{5}{41} + \frac{16}{41} - \frac{14}{41}$

   $\frac{1}{41} + \frac{5}{41} + \frac{16}{41} - \frac{14}{41} = \frac{1+5+16-14}{41} = \frac{22-14}{41} = \frac{8}{41}$

   (f) $\frac{1}{99} + \frac{5}{99} + \frac{7}{99} + \frac{2}{99}$

   $\frac{1}{99} + \frac{5}{99} + \frac{7}{99} + \frac{2}{99} = \frac{1+5+7+2}{99} = \frac{15}{99} = \frac{5}{33}$

   (g) $\frac{14}{17} - \frac{7}{17}$

$\frac{14}{17} - \frac{7}{17} = \frac{14-7}{17} = \frac{7}{17}$

2. Calculate the following (and express your answers in their lowest terms):

   (a) $\frac{4}{15} + \frac{3}{20}$

   The lowest common multiple of 15 and 20 is 60 ($15 = 3\times5$, $20 = 4\times5$, so the LCM $= 3\times4\times5 = 60$. This is the *lowest common denominator*. Make both of your fractions have 60 as the denominator: $\frac{4}{15} = \frac{16}{60}$, while $\frac{3}{20} = \frac{9}{60}$. Now you can add them: $\frac{16}{60} + \frac{9}{60} = \frac{16+9}{60} = \frac{25}{60} = \frac{5}{12}$, where you reduced the fraction by dividing the numerator and the denominator by the highest common factor, 5.

   (b) $\frac{3}{5} - \frac{7}{9} + \frac{4}{15}$

   The LCD is 45. So $\frac{3}{5} - \frac{7}{9} + \frac{4}{15} = \frac{27}{45} - \frac{35}{45} + \frac{12}{45} = \frac{27-35+12}{45} = \frac{4}{45}$

   (c) $\frac{2}{3} - \frac{1}{6}$

   $\frac{2}{3} - \frac{1}{6} = \frac{4}{6} - \frac{1}{6} = \frac{4-1}{6} = \frac{3}{6} = \frac{1}{2}$

   (d) $\frac{5}{16} + \frac{3}{16}$

   $\frac{5}{16} + \frac{3}{16} = \frac{5+3}{16} = \frac{8}{16} = \frac{1}{2}$

   (e) $\frac{1}{4} + \frac{1}{8}$

   $\frac{1}{4} + \frac{1}{8} = \frac{2}{8} + \frac{1}{8} = \frac{2+1}{8} = \frac{3}{8}$

   (f) $1 - \frac{7}{8}$

   $1 - \frac{7}{8} = \frac{8}{8} - \frac{7}{8} = \frac{1}{8}$

   (g) $1 - \frac{1}{16}$

   $1 - \frac{1}{16} = \frac{16}{16} - \frac{1}{16} = \frac{16-1}{16} = \frac{15}{16}$

3. Calculate the following (and express your answers in their lowest terms):

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

$1\frac{1}{2} + \frac{3}{4} = \frac{3}{2} + \frac{3}{4} = \frac{6}{4} + \frac{3}{4} = \frac{6+3}{4} = \frac{9}{4} = 2\frac{1}{4}$

(b) $2\frac{3}{7} + 5\frac{1}{2}$

This time, let's just add the proper fractions and the numbers separately:

$2\frac{3}{7} + 5\frac{1}{2} = 2 + 5 + \frac{3}{7} + \frac{1}{2} = 7 + \frac{6}{14} + \frac{7}{14} = 7 + \frac{6+7}{14} = 7 + \frac{13}{14} = 7\frac{13}{14}$
This is sometimes easier than working out all the improper fractions, but you have to be careful to carry all your terms from line to line.

(c) $4\frac{2}{3} - 3\frac{1}{2}$

$4\frac{2}{3} - 3\frac{1}{2} = \frac{14}{3} - \frac{7}{2} = \frac{28}{6} - \frac{21}{6} = \frac{28-21}{6} = \frac{7}{6} = 1\frac{1}{6}$

(d) $9\frac{16}{17} - 2$

$9\frac{16}{17} - 2 = 9 - 2 + \frac{16}{17} = 7\frac{16}{17}$

(e) $4\frac{3}{4} + 8\frac{2}{3}$

$4\frac{3}{4} + 8\frac{2}{3} = 4 + 8 + \frac{3}{4} + \frac{2}{3} = 12 + \frac{9}{12} + \frac{8}{12} = 12 + \frac{17}{12} = 12 + 1\frac{5}{12} = 13\frac{5}{12}$

(f) $7\frac{1}{2} - 2\frac{2}{3}$

$7\frac{1}{2} - 2\frac{2}{3} = \frac{15}{2} - \frac{8}{3} = \frac{45}{6} - \frac{16}{6} = \frac{45-16}{6} = \frac{29}{6} = 4\frac{5}{6}$

(g) $5\frac{2}{3} + 3\frac{1}{2} - 4\frac{1}{4}$

$5\frac{2}{3} + 3\frac{1}{2} - 4\frac{1}{4} = 4 + \frac{2}{3} + \frac{1}{2} - \frac{1}{4} = 4 + \frac{8}{12} + \frac{6}{12} - \frac{3}{12} = 4 + \frac{11}{12} = 4\frac{11}{12}$

4. Solve the following equations:

(a) $x + \frac{1}{4} = \frac{3}{4}$

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

(b) $x - \frac{1}{2} = \frac{1}{3}$

$x - \frac{1}{2} = \frac{1}{3}$
$x = \frac{1}{3} + \frac{1}{2}$
$x = \frac{2}{6} + \frac{3}{6} = \frac{5}{6}$

(c) $4 - x = 2\frac{2}{3}$

$4 - x = 2\frac{2}{3}$
$4 - 2\frac{2}{3} = x$
$x = 2 - \frac{2}{3}$
$x = \frac{6}{3} - \frac{2}{3}$
$x = \frac{4}{3} = 1\frac{1}{3}$

(d) $x + 7\frac{1}{7} = \frac{4}{7}$

$x + 7\frac{1}{7} = \frac{4}{7}$
$x = \frac{4}{7} - 7\frac{1}{7}$
$x = \frac{4}{7} - \frac{50}{7}$
$x = \frac{4-50}{7}$
$x = \frac{-46}{7}$
$x = -\frac{46}{7}$
$x = -6\frac{4}{7}$

(e) $2 + x = 3\frac{3}{4}$

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

(f) $x + \frac{1}{2} = \frac{5}{17}$

$x + \frac{1}{2} = \frac{5}{17}$
$x = \frac{5}{17} - \frac{1}{2}$
$x = \frac{10}{34} - \frac{17}{34}$
$x = \frac{10-17}{34}$
$x = -\frac{7}{34}$

(g) $x - 2 = \frac{4}{13}$

$x - 2 = \frac{4}{13}$
$x = 2 + \frac{4}{13}$
$x = 2\frac{4}{13}$

5. Thomas has a pizza party at work and brings home some of the leftover pizza for his kids. The pizzas have 8 slices. He brings home 3 slices of pepperoni pizza and four of plain pizza.

   (a) What fraction of a pepperoni pizza does he have?

   He has 3/8 of a pepperoni pizza

   (b) What fraction of a plain pizza does he have?

   He has $4/8 = 1/2$ of a plain pizza

   (c) The first kid takes a slice of pepperoni and half of the plain pizza. The second kid takes two pepperoni slices. The third kid gets the rest. What fraction of the pizza that Thomas brought home does the third kid get?

   The first kid eats 1 slice of pepperoni and the second eats 2 slices. That's 3 slices altogether, which is all the pepperoni that Thomas brought home. The first kid eats 1/2 of the plain pizza, or 2 slices. That means that the third kid gets two slices of plain pizza. Thomas brought home 3 slices of pepperoni plus 4 slices of plain = 7 slices altogether. So his third kid eats 2/7 of all the pizza that Thomas brought home.