FRACTIONS, ADDITION & SUBTRACTION

FACT 1: We add and subtract like fractions, by adding and subtracting numerators.

$$\frac{1}{4} + \frac{2}{4} = 1 \text{ of } \frac{1}{4} + 2 \text{ of } \frac{1}{4} = 3 \text{ of } \frac{1}{4}$$

Or, $$\frac{1}{4} + \frac{2}{4} = \frac{1+2}{4} = \frac{3}{4}$$

$$\frac{18}{25} - \frac{3}{25} = \frac{18-3}{25} = \frac{15}{25} = \frac{3}{5}$$

FACT 2: We add and subtract unlike fractions, by adding and subtracting their equivalent like fractions.

The LCM of 6 and 9 is 18, therefore

$$\frac{5}{6} + \frac{7}{9} = \frac{5\,x3}{6\,x3} + \frac{7x2}{9\,x2} = \frac{15}{18} + \frac{14}{18} = \frac{29}{18}$$

The LCM of 15 and 18 is 90, therefore

$$\frac{4}{15} - \frac{7}{18} = \frac{4x6 - 7x5}{90} = \frac{24-35}{90} = -\frac{11}{90}$$

The LCM of 6, 14, 21 is 42, therefore

$$\frac{5}{6} + \frac{9}{14} - \frac{11}{21} = \frac{5x7 + 9x3 - 11x2}{42} = \frac{35+27-22}{42} = \frac{40}{42} = \frac{20}{21}$$

FACT 2: Mixed numbers may be added or subtracted as improper fractions, or as mixed numbers.

$$2\frac{5}{8} + 3\frac{7}{12} = \frac{21}{8} + \frac{43}{12} = \frac{63+86}{24} = \frac{149}{24} = 6\frac{5}{24}$$

$$3\frac{7}{12} - 2\frac{5}{8} = (3-2) + \left(\frac{7}{12} - \frac{5}{8}\right) = 1 + \frac{14-15}{24}$$

$$= 1 + \left(-\frac{1}{24}\right) = 1 - \frac{1}{24} = \frac{23}{24}$$

1. Add and subtract the following. Reduce the result to the simplest form.

(a) $\frac{7}{18} + \frac{5}{18}$ (b) $\frac{5}{16} + \frac{3}{16}$ (c) $\frac{8}{45} + \frac{3}{45} + \frac{4}{45}$

(d) $\frac{4}{15} + \frac{7}{12}$ (e) $\frac{15}{16} + \frac{3}{24}$ (f) $\frac{7}{15} + \frac{3}{25} + \frac{11}{35}$

(g) $\frac{5}{12} - \frac{13}{14}$ (h) $\frac{21}{25} - \frac{29}{35}$ (i) $\frac{29}{55} - \frac{17}{33}$

Answer: (a) 2/3 (b) 1/2 (c) 1/3 (d) 17/20 (e) 17/16 (f) 473/525 (g) – 43/84 (h) 2/175 (i) 2/165

2. Add and subtract the following. Reduce the result to the simplest form.

(a) $5\frac{4}{5} + 9\frac{3}{4}$ (b) $8\frac{5}{14} + 3\frac{3}{7}$ (c) $5\frac{2}{15} + 4\frac{1}{6} + 1\frac{3}{10}$

(d) $9\frac{3}{4} - 5\frac{4}{5}$ (e) $8\frac{5}{14} - 3\frac{3}{7}$ (f) $5\frac{2}{15} - 4\frac{1}{6}$

Answer: (a) 15 11/20 (b) 11 11/14 (c) 10 3/5 (d) 3 19/20 (e) 4 13/14 (f) 29/30

End of Lesson