Name: _____ Date: _____

MFM2P: Foundations of Mathematics 10 Numeracy and Algebra

Adding and Subtracting Fractions

1. Lowest Common Multiple (LCM)

   The LCM of two values is the smallest value that is a multiple of both values.
   Making a list of multiples for each value may make it easier to find the LCM.

   LCM of 6 and 8 is 24.
   6: 6 12 18 **24** 30 …
   8: 8 16 **24** 32 40 …

2. Equivalent Fractions Using a Common Denominator

   If possible, use the LCM of the denominators in the fractions being add/sub.
   Convert each fraction to an equivalent using the LCM as the denominator.
   If you cannot determine the LCM, multiply the denominators by each other.

   $\frac{5}{9}+\frac{7}{12}$, LCM is 36
   $\frac{5\times4}{9\times4}+\frac{7\times3}{12\times3}=\frac{20}{36}+\frac{21}{36}$
   $\frac{5\times12}{9\times12}+\frac{7\times9}{12\times9}=\frac{60}{108}+\frac{63}{108}$

3. Adding/Subtracting

   Add the numerators. Leave the denominator the same.
   If necessary, reduce fractions to simplest terms.

   $\frac{20}{36}+\frac{21}{36}=\frac{20+21}{36}=\frac{41}{36}$
   $\frac{60}{108}+\frac{63}{108}=\frac{123\div3}{108\div3}=\frac{41}{36}$

4. Examples

A. Evaluate $\frac{1}{3}+\frac{1}{6}$.

The LCM of 3 and 6 is 6, which is the same as one of the denominators. Use 6 as the new denominator.

$$\frac{1\times2}{3\times2}+\frac{1}{6}=\frac{2}{6}+\frac{1}{6}$$

Add the numerators.

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

Simplify the fraction.

$$\frac{3\div3}{6\div3}=\frac{1}{2}$$

B. Evaluate $\frac{2}{5}+\frac{3}{8}$.

The LCM of 5 and 8 is 40, which is the same as their product. Use 40 as the new denominator.

$$\frac{2\times8}{5\times8}+\frac{3\times5}{8\times5}=\frac{16}{40}+\frac{15}{40}$$

Add the numerators.

$$\frac{16}{40}+\frac{15}{40}=\frac{16+15}{40}=\frac{31}{40}$$

C. Evaluate $\frac{7}{8}-\frac{5}{12}$.

The LCM of 8 and 12 is 24. Use 24 as the new denominator.

$$\frac{7\times3}{8\times3}-\frac{5\times2}{12\times2}=\frac{21}{24}-\frac{10}{24}$$

Subtract the numerators.

$$\frac{21}{24}-\frac{10}{24}=\frac{21-10}{24}=\frac{11}{24}$$