Lesson: Fraction Operations

Adding and Subtracting Fractions

To add or subtract fractions the denominators must be the same. Then, you add or subtract the numerators, and the denominators stay the same.

Example 5: $\frac{-1}{2}+\frac{3}{4}$ Lowest Common Denominator 2, 4, 6, 8, … 4, 8, 12, 16, … $=\frac{-1\times2}{2\times2}+\frac{3\times1}{4\times1}$ $=\frac{-2}{4}+\frac{3}{4}$ $=\frac{-2+3}{4}$ $\frac{1}{4}$	Example 6: $\frac{5}{6}-\left(\frac{-3}{4}\right)=\frac{5}{6}+\frac{3}{4}$ LCD: 12 4, 8, 12, 16, … 6, 12, 18, 24, … $=\frac{5\times2}{6\times2}+\frac{3\times3}{4\times3}$ $=\frac{10}{12}+\frac{9}{12}=\frac{10+9}{12}=\frac{19}{12}$
Example 7: $1\frac{1}{2}+2\frac{3}{4}=\frac{1\cdot2+1}{2}+\frac{2\cdot4+3}{4}$ $=\frac{3\times2}{2\times2}+\frac{11}{4}$ LCD: 4 $=\frac{6}{4}+\frac{11}{4}$ $=\frac{6+11}{4}=\frac{17}{4}$	Example 8: $-2\frac{1}{5}-4\frac{2}{3}=-\frac{2\cdot5+1}{5}-\frac{4\cdot3+2}{3}$ $=\frac{-11\times3}{5\times3}-\frac{14\times5}{3\times5}$ 3, 6, 9, 12, 15 5, 10, 15 $=\frac{-33}{15}-\frac{70}{15}$ GCF: 3 $=\frac{-33-70}{15}=\frac{-103}{15}$

Practice: Operations with Fractions

Evaluate the following: *final answers should be in lowest terms

a. $\frac{1}{2}+\frac{3}{7}$ LCD: 4
$=\frac{7}{14}+\frac{6}{14}$
$=\frac{7+6}{14}$
$=\frac{13}{14}$

b. $\frac{-1}{4}+\frac{-2}{5}$ LCD: 20
$=\frac{-5}{20}-\frac{8}{20}$
$=\frac{-5-8}{20}$
$=-\frac{13}{20}$

c. $\frac{1}{8}+2\frac{1}{6}=\frac{1}{8}+\frac{2\cdot6+1}{6}$
$=\frac{1\cdot3}{8\cdot3}+\frac{13\cdot4}{6\cdot4}$ LCD: 24
$=\frac{3}{24}+\frac{52}{24}$
$=\frac{3+52}{24}=\frac{55}{24}$

d. $\frac{-1}{2}+\frac{2}{3}+2\frac{1}{6}=\frac{-1}{2}+\frac{2}{3}+\frac{2\cdot6+1}{6}$
$=\frac{-1\cdot3}{2\cdot3}+\frac{2\cdot2}{3\cdot2}+\frac{13\cdot1}{6\cdot1}$ LCD: 6
$=\frac{-3}{6}+\frac{4}{6}+\frac{13}{6}$ GCF: 2
$=\frac{-3+4+13}{6}=\frac{14}{6}=\frac{7}{3}$

e. $\frac{2}{3}-\frac{1}{5}$ LCD: 15
$=\frac{10}{15}-\frac{3}{15}$
$=\frac{10-3}{15}$
$=\frac{7}{15}$

f. $\frac{8}{3}-\frac{9}{5}$ LCD: 15
$=\frac{40}{15}-\frac{27}{15}$
$=\frac{40-27}{15}$
$=\frac{13}{15}$

g. $2\frac{2}{3}-4\frac{1}{5}=\frac{2\cdot3+2}{3}-\frac{4\cdot5+1}{5}$
$=\frac{8\cdot5}{3\cdot5}-\frac{21\cdot3}{5\cdot3}$ LCD: 15
$=\frac{40}{15}-\frac{63}{15}$
$=\frac{40-63}{15}=-\frac{23}{15}$

h. $-2\frac{1}{3}-3\frac{1}{6}=-\frac{2\cdot3+1}{3}-\frac{3\cdot6+1}{6}$
$=\frac{-7\cdot2}{3\cdot2}-\frac{19}{6}$ LCD: 6
$=\frac{-14}{6}-\frac{19}{6}$ GCF: 3
$=\frac{-14-19}{6}=\frac{-33}{6}=\frac{-11}{2}$

ANSWERS: a. $\frac{13}{14}$ b. $\frac{-13}{20}$ c. $\frac{55}{24}$ d. $\frac{7}{3}$ e. $\frac{7}{15}$ f. $\frac{13}{15}$ g. $\frac{-23}{15}$ h. $\frac{-11}{2}$