**M9**

# Adding and Subtracting Fractions

**Remember** that whenever you add and/or subtract fractions, you need to express all fractions with the same denominator (=common denominator).

To find the common denominator find the LCM of all the original denominators.

**Equivalent Fractions = fractions that represent the same value.**

Examples of equivalent fractions:

$\frac{3}{5} \overset{\times 2}{=} \frac{6}{10} \overset{\times 3}{=} \frac{18}{30} \overset{\times 100}{=} \frac{1800}{3000}$

"Treat the numerator and the denumerator The Same"

$-\frac{4}{7} \overset{\times 2}{=} -\frac{8}{14} \overset{\times 3}{=} -\frac{24}{42} = -\frac{20}{35}$

$6\frac{1}{2} = \frac{13}{2} \overset{\times 2}{=} \frac{26}{4} \overset{\times 2}{=} \frac{52}{8}$

Practice:

1

$\frac{4}{5} - \frac{2}{10} + \frac{1}{15} =$

$\frac{4}{5} \overset{\times 6}{=} \frac{24}{30} - \frac{2}{10} \overset{\times 3}{=} \frac{6}{30} + \frac{1}{15} \overset{\times 2}{=} \frac{2}{30}$

$\frac{18}{30} + \frac{2}{30} = \frac{20}{30} \overset{\div 10}{=}$ Reduce $\rightarrow \boxed{\frac{2}{3}}$

LCM (5, 10, 15)

5, 10, 15, 20, 25, 30

10, 20, 30

15, 30

Lcm = 30

**2**

$1\frac{1}{3}-\frac{4}{9}-5\frac{1}{2}=$ $\frac{4}{3}^{\times 6}-\frac{4}{9}^{\times 2}-\frac{11}{2}^{\times 9}$

$=\frac{24}{18}-\frac{8}{18}-\frac{99}{18}$

$=\frac{-83}{18}=-4\frac{11}{18}$

LCM (3, 9, 2)

3, 6, 9, 12, 15, 18

9, 18

2, 4, 6, 8, 10, 12, 14, 16, 18

LCM = 18

$83 \div 18 = 4, 16\ldots$

$83-[4\times 18]=11$

**3**

$-\frac{3}{16}^{\times 3}+\frac{-2}{24}^{\times 2}+\frac{5}{6}^{\times 8}=$ $\frac{-9}{48}+\frac{(-4)}{48}+\frac{40}{48}$

$=\frac{-13+40}{48}$

$=\frac{27\div 3}{48\div 3}=\boxed{\frac{9}{16}}$

LCM (16, 24, 6)

16, 32, 48

24, 48

6, 12, 18, 24, 30, 36, 42, 48

LCM = 48

**4**

$-5\frac{4}{7}-\frac{3}{10}-2+\frac{1}{5}=$ $-\frac{39}{7}^{\times 10}-\frac{3}{10}^{\times 7}-\frac{2}{1}^{\times 70}+\frac{1}{5}^{\times 14}$

$=-\frac{390}{70}-\frac{21}{70}-\frac{140}{70}+\frac{14}{70}$

$=-\frac{411}{70}-\frac{140}{70}+\frac{14}{70}$

$=-\frac{551}{70}+\frac{14}{70}$

$=-\frac{537}{70}=-7\frac{47}{70}$

LCM (7, 10, 1, 5)

$7\times 10=70$

$10\times 7=70$

$5\times 14=70$

$537\div 70=7.67$

$537-[7\times 70]$

$537-490$

$47$