BASIC OPERATIONS WITH FRACTIONS

Solve the following exercises by completing the blank spaces.

1. Add or subtract the following fractions with the **butterfly method**. Simplify your answer and write it as mixed number, if possible.

a. $\quad -\dfrac{9}{10} + \dfrac{4}{9} = \dfrac{(-9\cdot9)+\left(\square\cdot10\right)}{10\cdot\square} = \dfrac{\boxed{}+\boxed{}}{\boxed{}} = \dfrac{\boxed{}}{\boxed{}} = -\dfrac{\boxed{}}{\boxed{}}$

b. $\quad -\dfrac{3}{7} - \dfrac{10}{11} = \dfrac{\left(\square\cdot11\right)-(10\cdot7)}{\square\cdot11} = \dfrac{\boxed{}-\boxed{}}{77} = \dfrac{\boxed{}}{77} = -\dfrac{\boxed{}}{77} = -\boxed{}\dfrac{\boxed{}}{77}$

2. Add or subtract the following fractions with the **LCM method**.

a. $\quad \dfrac{5}{6} - \dfrac{7}{18} - \dfrac{2}{9}$

$M_{18} = \{\square, \dots\}$

$M_9 = \{9, \square, \dots\}$ $\quad\Rightarrow\quad$ LCM$(6, 9, 18) = \square$

$M_6 = \{6, 12, \square, \dots\}$

$\dfrac{5\cdot\square}{6\cdot\square} - \dfrac{7}{18} - \dfrac{2\cdot\square}{9\cdot\square} = \dfrac{\square}{\square} - \dfrac{7}{18} - \dfrac{\square}{\square} = \dfrac{\square-7-\square}{18} = \dfrac{4\div\square}{18\div\square} = \dfrac{2}{9}$

b. $\quad -\dfrac{7}{14} + \dfrac{4}{21}$

$M_{21} = \{21, \square, \dots\}$

$\quad\Rightarrow\quad$ LCM$(14, 21) = \square$

$M_{14} = \{14, 28, \square, \dots\}$

$-\dfrac{7\cdot\square}{14\cdot\square} + \dfrac{4\cdot\square}{21\cdot\square} = -\dfrac{\square}{\square} + \dfrac{\square}{\square} = \dfrac{\square+\square}{42} = \dfrac{\square}{42} = -\dfrac{\square}{42}$

3. Solve the following exercises. Simplify your answer and write it as mixed number, if possible.

a. $\quad -2\dfrac{2}{3} \cdot 1\dfrac{1}{17} = -\dfrac{\square}{3} \cdot \dfrac{\square}{17} = -\dfrac{8}{3\div\square} \cdot \dfrac{18\div\square}{17} = -\dfrac{8}{\square} \cdot \dfrac{\square}{17} = -\dfrac{\square}{\square} = \boxed{}\dfrac{\square}{\square}$

b. $\quad 2\dfrac{13}{18} \div 2\dfrac{11}{12} = \dfrac{\square}{18} \div \dfrac{\square}{12} = \dfrac{\square}{18} \cdot \dfrac{\square}{\square} = \dfrac{\square\div7}{18\div\square} \cdot \dfrac{\square\div\square}{\square\div7} = \dfrac{\square}{\square} \cdot \dfrac{\square}{\square} = \dfrac{\square}{\square}$