

Addition and multiplication

$$\textcircled{1} \quad \frac{3}{4} \left(\frac{3}{4} - \frac{4}{6} \right) = \frac{3}{4} \cdot \frac{3}{4} - \frac{3}{4} \cdot \frac{4}{6} = \frac{3 \cdot 3}{4 \cdot 4} - \frac{1}{2} = \frac{9}{8} - \frac{1}{2} = \frac{9 \cdot 2 - 1 \cdot 8}{8 \cdot 2} = \frac{2(9-4)}{2 \cdot 8} = \frac{5}{8}$$

$$\textcircled{2} \quad -1 + \frac{1}{3} + \frac{6}{3} = -1 + \frac{1}{3} + 2 = -1 + 2 + \frac{1}{3} = \frac{1}{1} + \frac{1}{3} = \frac{1 \cdot 3 + 1 \cdot 1}{1 \cdot 3} = \frac{4}{3}$$

$$\textcircled{4} \quad \frac{\frac{2}{7}}{\frac{2}{2}} - \frac{\frac{2}{5}}{2} = \frac{\frac{2}{1}}{\frac{1}{2}} - \frac{\frac{2}{5}}{\frac{2}{1}} = \frac{2}{1} \times \frac{2}{1} - \frac{2}{5} \times \frac{1}{2} = \frac{4}{1} - \frac{1}{5} = \frac{20-1}{5} = \frac{19}{5}$$

$$\textcircled{6} \quad \frac{\frac{2}{3} + \frac{1}{2}}{\frac{3}{2} + 2} = \frac{\frac{2 \cdot 2 + 3 \cdot 1}{3 \cdot 2}}{\frac{3 \cdot 1 + 2 \cdot 2}{2 \cdot 1}} = \frac{\frac{7}{6}}{\frac{7}{2}} = \frac{7}{6} \times \frac{2}{7} = \frac{1}{3}$$

$$\textcircled{6} \quad \sqrt{2} (\sqrt{2} + 6\sqrt{4}) = (\sqrt{2})^2 + 6\sqrt{2} \sqrt{4} = 2 + 6 \times 2\sqrt{2} = 2 + 12\sqrt{2}$$

$$a(c-d) = a \cdot c - a \cdot d$$

$$\frac{a}{b} \div \frac{c}{d} = \frac{a \cdot d + c \cdot b}{b \cdot d}$$

$$\frac{\frac{a}{b}}{\frac{c}{d}} = \frac{a}{b} \times \frac{d}{c}$$

$$(\sqrt{a})^2 = a$$