

Adding & Subtracting Fractions

(Warm-Up) Find each sum.

$$1) \frac{5 \times 2}{3 \times 2} + \frac{11}{6} = \frac{10}{6} + \frac{11}{6}$$

$$= \frac{21}{6} = \frac{7}{2}$$

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

$$2) \frac{1 \times 3}{4 \times 3} + \frac{5 \times 4}{3 \times 4} = \frac{3}{12} + \frac{20}{12}$$

$$= \frac{23}{12}$$

$$= \boxed{1\frac{11}{12}}$$

$$3) \frac{4}{7} + 3\frac{1}{2} = \frac{4 \times 2}{7 \times 2} + \frac{7 \times 7}{2 \times 7}$$

$$= \frac{8}{14} + \frac{49}{14}$$

$$= \frac{57}{14} = \boxed{4\frac{1}{14}}$$

$$4) 3\frac{5}{6} + 2\frac{1}{2} = \frac{23}{6} + \frac{5 \times 3}{2 \times 3}$$

$$= \frac{23}{6} + \frac{15}{6}$$

$$= \frac{38}{6} = \frac{19}{3} = \boxed{6\frac{1}{3}}$$

(Warm-Up) Find each difference.

$$5) \frac{5}{3} - \frac{1}{3} = \frac{4}{3} = \boxed{1\frac{1}{3}}$$

$$6) \frac{2 \times 8}{3 \times 8} - \frac{1 \times 3}{8 \times 3} = \frac{16}{24} - \frac{3}{24}$$

$$= \boxed{\frac{13}{24}}$$

$$7) 1\frac{5}{6} - \frac{3}{2} = \frac{11}{6} - \frac{3 \times 3}{2 \times 3}$$

$$= \frac{11}{6} - \frac{9}{6}$$

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

$$8) 3\frac{1}{6} - 2\frac{5}{7} = \frac{19 \times 7}{6 \times 7} - \frac{19 \times 6}{7 \times 6}$$

$$= \frac{133}{42} - \frac{114}{42}$$

$$= \boxed{\frac{19}{42}}$$

$$\begin{array}{r} 6 \\ 19 \\ \times 7 \\ \hline 133 \\ 5 \\ 19 \\ \times 6 \\ \hline 114 \\ 2 \\ \hline 133 \\ - 114 \\ \hline 19 \end{array}$$

Developing Find each sum.

$$9) \left(-\frac{2}{5}\right) + \frac{1 \times 5}{8 \times 5} = \frac{-16}{40} + \frac{5}{40}$$

$$= \boxed{\frac{-11}{40}}$$

$$10) \left(-\frac{5}{3}\right) + \left(-\frac{4}{5}\right) = \frac{-25}{15} + \frac{-12}{15}$$

$$= \frac{-37}{15}$$

$$= \boxed{-2\frac{7}{15}}$$

$$\begin{aligned}
 11) \quad 1\frac{1}{2} + \left(-\frac{6}{5}\right) &= \frac{2 \times 5}{2 \times 5} + \frac{-6 \times 2}{5 \times 2} \\
 &= \frac{15}{10} + \frac{-12}{10} \\
 &= \boxed{\frac{3}{10}}
 \end{aligned}$$

$$\begin{aligned}
 12) \quad \left(-\frac{3}{2}\right) + \left(-2\frac{5}{7}\right) &= \frac{-3 \times 7}{2 \times 7} + \frac{-19 \times 2}{7 \times 2} \\
 &= \frac{-21}{14} + \frac{-38}{14} \\
 &= \frac{-59}{14} = \boxed{-4\frac{3}{14}}
 \end{aligned}$$

$$\begin{array}{r}
 14 \\
 +14 \\
 \hline
 28 \\
 +14 \\
 \hline
 42 \\
 +14 \\
 \hline
 56 \\
 \\
 2 \\
 14 \\
 \times 7 \\
 \hline
 98
 \end{array}$$

$$\begin{aligned}
 13) \quad 2\frac{6}{7} + \left(-2\frac{4}{5}\right) &= \frac{20 \times 5}{7 \times 5} + \frac{-14 \times 7}{5 \times 7} \\
 &= \frac{100}{35} + \frac{-98}{35} \\
 &= \boxed{\frac{2}{35}}
 \end{aligned}$$

$$\begin{aligned}
 14) \quad \left(-1\frac{3}{8}\right) + 4\frac{3}{8} &= \frac{-11}{8} + \frac{35}{8} \\
 &= \frac{24}{8} \\
 &= \boxed{3}
 \end{aligned}$$

Find each difference.

$$\begin{aligned}
 15) \quad \frac{3}{4} - \frac{5}{4} &= \frac{-2}{4} \\
 &= \boxed{\frac{-1}{2}}
 \end{aligned}$$

$$\begin{aligned}
 16) \quad \left(-\frac{7}{4}\right) - \frac{1}{6} &= \frac{-7 \times 3}{4 \times 3} - \frac{1 \times 2}{6 \times 2} = \frac{-21}{12} - \frac{2}{12} \\
 &= \frac{-23}{12} \\
 &= \boxed{-1\frac{11}{12}}
 \end{aligned}$$

$$\begin{aligned}
 17) \quad 2\frac{1}{2} - \left(-\frac{1}{3}\right) &= \frac{5 \times 3}{2 \times 3} + \frac{1 \times 2}{3 \times 2} \\
 &= \frac{15}{6} + \frac{2}{6} \\
 &= \frac{17}{6} = \boxed{2\frac{5}{6}}
 \end{aligned}$$

$$\begin{aligned}
 18) \quad \frac{3}{5} - 1\frac{5}{8} &= \frac{3 \times 8}{5 \times 8} - \frac{13 \times 5}{8 \times 5} \\
 &= \frac{24}{40} - \frac{65}{40} \\
 &= \frac{-41}{40} = \boxed{-1\frac{1}{40}}
 \end{aligned}$$

$$\begin{aligned}
 19) \quad 3\frac{3}{4} - \left(-1\frac{3}{4}\right) &= \frac{15}{4} + \frac{7}{4} \\
 &= \frac{22}{4} = \frac{11}{2} \\
 &= 5\frac{2}{4} = \boxed{5\frac{1}{2}}
 \end{aligned}$$

$$\begin{aligned}
 20) \quad \left(-2\frac{2}{3}\right) - 3\frac{2}{3} &= \frac{-8}{3} - \frac{11}{3} \\
 &= \frac{-19}{3} \\
 &= \boxed{-6\frac{1}{3}}
 \end{aligned}$$

Proficient: Evaluate each expression.

$$21) \left(-\frac{3}{4}\right) + \left(+\frac{5}{4}\right) = \frac{2}{4}$$

$$= \boxed{\frac{1}{2}}$$

$$22) \left(-\frac{8}{7}\right) + \frac{1}{4} = \frac{-32}{28} + \frac{7}{28}$$

$$= \boxed{\frac{-25}{28}}$$

$$23) \left(-1\frac{1}{4}\right) + \left(-\frac{9}{8}\right) = \frac{-5 \times 2}{4 \times 2} + \frac{-9}{8}$$

$$= -\frac{10}{8} + \frac{-9}{8}$$

$$= \frac{-19}{8} = \boxed{-2\frac{3}{8}}$$

$$24) (-4) - \left(-\frac{4}{3}\right) = \frac{-4 \times 3}{1 \times 3} + \frac{4}{3}$$

$$= -\frac{12}{3} + \frac{4}{3}$$

$$= \frac{-8}{3} = \boxed{-2\frac{2}{3}}$$

$$25) \left(-1\frac{2}{3}\right) + \left(-1\frac{7}{8}\right) = \frac{-5 \times 8}{3 \times 8} + \frac{-15 \times 3}{8 \times 3}$$

$$= \frac{-40}{24} + \frac{-45}{24}$$

$$= \frac{-85}{24} = \boxed{-3\frac{13}{24}}$$

$$26) 1\frac{5}{8} - \frac{3}{7} = \frac{13 \times 7}{8 \times 7} - \frac{3 \times 8}{7 \times 8}$$

$$= \frac{91}{56} - \frac{24}{56}$$

$$= \frac{67}{56} = \boxed{1\frac{11}{56}}$$

$$\begin{array}{r} 2 \\ 13 \\ \times 7 \\ \hline 91 \\ + 24 \\ \hline 115 \\ - 24 \\ \hline 91 \\ - 24 \\ \hline 67 \end{array}$$

$$27) \left(-2\frac{2}{3}\right) + \frac{1}{4} = \frac{-8 \times 4}{3 \times 4} + \frac{1 \times 3}{4 \times 3}$$

$$= \frac{-32}{12} + \frac{3}{12}$$

$$= \frac{-29}{12} = \boxed{-2\frac{5}{12}}$$

$$28) 3\frac{7}{8} + \left(-1\frac{7}{8}\right) = \frac{31}{8} + \frac{-15}{8}$$

$$= \frac{16}{8}$$

$$= \boxed{2}$$

$$29) 3\frac{2}{7} + \left(-2\frac{1}{5}\right) = \frac{23 \times 5}{7 \times 5} + \frac{-11 \times 7}{5 \times 7}$$

$$= \frac{115}{35} + \frac{-77}{35}$$

$$= \frac{38}{35} = \boxed{1\frac{3}{35}}$$

$$30) (-7) - \left(-\frac{11}{6}\right) = \frac{-7 \times 6}{1 \times 6} + \frac{11}{6}$$

$$= \frac{-42}{6} + \frac{11}{6}$$

$$= \frac{-31}{6} = \boxed{-5\frac{1}{6}}$$

$$\begin{array}{r} 1 \\ 23 \\ \times 5 \\ \hline 115 \\ + 115 \\ \hline 230 \\ - 77 \\ \hline 153 \end{array}$$

$$31) (-1) - \left(-1\frac{2}{3}\right) = \frac{-1 \times 3}{1 \times 3} + \frac{5}{3}$$

$$= \frac{-3}{3} + \frac{5}{3}$$

$$= \boxed{\frac{2}{3}}$$

$$32) 1\frac{1}{5} - 2\frac{3}{4} = \frac{6 \times 4}{5 \times 4} - \frac{11 \times 5}{4 \times 5}$$

$$= \frac{24}{20} - \frac{55}{20}$$

$$= \frac{-31}{20} = \boxed{-1\frac{11}{20}}$$

$$\begin{array}{r} 55 \\ - 24 \\ \hline 31 \end{array}$$

Extending: Evaluate each expression.

$$33) 1 + 3\frac{3}{5} - \left(-\frac{4}{3}\right) = \frac{1 \times 15}{1 \times 15} + \frac{18 \times 3}{5 \times 3} + \frac{4 \times 5}{3 \times 5}$$

$$= \frac{15}{15} + \frac{54}{15} + \frac{20}{15}$$

$$= \frac{89}{15} = \boxed{5\frac{14}{15}}$$

$$34) (-1) + \left(-\frac{3}{2}\right) - 1\frac{3}{7} = \frac{-1 \times 14}{1 \times 14} + \frac{-3 \times 7}{2 \times 7} - \frac{10 \times 2}{7 \times 2}$$

$$= \frac{-14}{14} + \frac{-21}{14} - \frac{20}{14}$$

$$= \frac{-55}{14} = \boxed{-3\frac{13}{14}}$$

$$35) 2 - \frac{8}{5} + 3\frac{3}{4} = \frac{2 \times 20}{1 \times 20} - \frac{8 \times 4}{5 \times 4} + \frac{15 \times 5}{4 \times 5}$$

$$= \frac{40}{20} - \frac{32}{20} + \frac{75}{20}$$

$$= \frac{83}{20} = \boxed{4\frac{3}{20}}$$

$$36) \left(-\frac{3}{2}\right) + 2 - \left(-\frac{2}{3}\right) = \frac{-3 \times 3}{2 \times 3} + \frac{2 \times 6}{1 \times 6} + \frac{2 \times 2}{3 \times 2}$$

$$= \frac{-9}{6} + \frac{12}{6} + \frac{4}{6}$$

$$= \frac{7}{6} = \boxed{1\frac{1}{6}}$$

$$37) \frac{1}{3} + \left(-\frac{1}{2}\right) + \left(-1\frac{2}{5}\right) = \frac{1 \times 10}{3 \times 10} - \frac{1 \times 15}{2 \times 15} - \frac{7 \times 6}{5 \times 6}$$

$$= \frac{10}{30} - \frac{15}{30} - \frac{42}{30}$$

$$= \frac{-47}{30} = \boxed{-1\frac{17}{30}}$$

$$38) \left(-\frac{7}{5}\right) - \frac{1}{4} + \frac{1}{2} + (-2) = \frac{-7 \times 4}{5 \times 4} - \frac{1 \times 5}{4 \times 5} + \frac{1 \times 10}{2 \times 10} - \frac{2 \times 20}{1 \times 20}$$

$$= \frac{-28}{20} - \frac{5}{20} + \frac{10}{20} - \frac{40}{20}$$

$$= \frac{-63}{20} = \boxed{-3\frac{3}{20}}$$

$$39) \left(-\frac{4}{3}\right) + \left(-2\frac{2}{3}\right) - \left(-2\frac{3}{5}\right) + \frac{5}{3} = \frac{-4 \times 5}{3 \times 5} - \frac{8 \times 5}{3 \times 5} + \frac{13 \times 3}{5 \times 3} + \frac{5 \times 5}{3 \times 5}$$

$$= \frac{-20}{15} - \frac{40}{15} + \frac{39}{15} + \frac{25}{15}$$

$$= \frac{-60}{15} + \frac{64}{15} = \boxed{\frac{4}{15}}$$

$$40) 2\frac{3}{5} + \left(-1\frac{1}{2}\right) - 1 + 1\frac{2}{3} = \frac{13 \times 6}{5 \times 6} + \frac{-3 \times 15}{2 \times 15} - \frac{1 \times 30}{1 \times 30} + \frac{5 \times 10}{3 \times 10}$$

$$= \frac{78}{30} - \frac{45}{30} - \frac{30}{30} + \frac{50}{30}$$

$$= \frac{53}{30} = \boxed{1\frac{23}{30}}$$

$$41) 1 + \left(-\frac{7}{4}\right) - \left(-\frac{1}{3}\right) + (-2) = \frac{1 \times 12}{1 \times 12} - \frac{7 \times 3}{4 \times 3} + \frac{1 \times 4}{3 \times 4} - \frac{2 \times 12}{1 \times 12}$$

$$= \frac{12}{12} - \frac{21}{12} + \frac{4}{12} - \frac{24}{12}$$

$$= \frac{-29}{12} = \boxed{-2\frac{5}{12}}$$

$$42) \left(-\frac{8}{5}\right) + \frac{1}{2} - \left(-1\frac{1}{2}\right) - \left(-\frac{3}{2}\right) = \frac{-8 \times 2}{5 \times 2} + \frac{1 \times 5}{2 \times 5} + \frac{3 \times 5}{2 \times 5} + \frac{3 \times 5}{2 \times 5}$$

$$= \frac{-16}{10} + \frac{5}{10} + \frac{15}{10} + \frac{15}{10}$$

$$= \frac{19}{10} = \boxed{1\frac{9}{10}}$$