

Exercise 2.3

$$1) \frac{1}{5} - \frac{3}{5} = \boxed{-\frac{2}{5}}$$

$$2) -\frac{3}{7} + \frac{2}{7} = \boxed{-\frac{1}{7}}$$

$$3) -\frac{5}{9} - \frac{2}{9} = \boxed{-\frac{7}{9}}$$

$$4) \frac{3}{4} - \frac{1}{4} = \frac{2}{4} = \boxed{\frac{1}{2}}$$

$$5) \frac{2}{9} + \frac{1}{9} = \frac{3}{9} = \boxed{\frac{1}{3}}$$

$$6) \frac{1}{12} - \left(-\frac{5}{12}\right) = \frac{1}{12} + \frac{5}{12} \\ = \frac{6}{12} = \boxed{\frac{1}{2}}$$

$$7) 3\frac{1}{3} + 2\frac{1}{3} \\ = \frac{10}{3} + \frac{1}{3} = \boxed{\frac{11}{3}} \text{ or } \boxed{5\frac{2}{3}}$$

$$8) ~~2\frac{3}{4} - 1\frac{1}{4}~~ 2\frac{3}{4} - 1\frac{1}{4} \\ = \frac{11}{4} - \frac{5}{4} \\ = \frac{6}{4} = 1\frac{2}{4} = \boxed{1\frac{1}{2}} \\ \text{or } \boxed{\frac{3}{2}}$$

$$9) 3\frac{4}{5} - 1\frac{2}{5} \\ = \frac{19}{5} - \frac{7}{5} = \boxed{\frac{12}{5} \text{ or } 2\frac{2}{5}}$$

$$10) -2\frac{1}{5} - 3\frac{3}{5} \\ = -\frac{11}{5} - \frac{18}{5} \\ = \boxed{-\frac{29}{5} \text{ or } -5\frac{4}{5}}$$

$$11) 2\frac{1}{4} - 7\frac{3}{4} = \frac{9}{4} - \frac{31}{4} \\ = -\frac{22}{4} = \boxed{-\frac{11}{2} \text{ or } -5\frac{1}{2}}$$

$$12) -3\frac{1}{6} - (-4\frac{5}{6}) \\ = -3\frac{1}{6} + 4\frac{5}{6} = -\frac{19}{6} + \frac{29}{6} \\ = \frac{10}{6} = \boxed{\frac{5}{3} \text{ or } 1\frac{2}{3}}$$

$$13) \frac{1}{3} - \frac{1}{4} \\ = \frac{1}{3} \cdot \frac{4}{4} - \frac{1}{4} \cdot \frac{3}{3} \\ = \frac{4}{12} - \frac{3}{12} = \boxed{\frac{1}{12}}$$

$$14) -\frac{4}{5} - \frac{1}{3} = -\frac{4}{5} \cdot \frac{3}{3} - \frac{1}{3} \cdot \frac{5}{5} \\ = -\frac{12}{15} - \frac{5}{15} = \boxed{-\frac{17}{15} \text{ or } -1\frac{2}{15}}$$

$$15) \frac{3}{4} - \left(-\frac{1}{5}\right) = \frac{3}{4} + \frac{1}{5} \\ = \frac{3}{4} \cdot \frac{5}{5} + \frac{1}{5} \cdot \frac{4}{4} \\ = \frac{15}{20} + \frac{4}{20} = \boxed{\frac{19}{20}}$$

$$16) \frac{3}{4} - \left(-\frac{1}{6}\right) \\ = \frac{3}{4} + \frac{1}{6} = \frac{3}{4} \cdot \frac{3}{3} + \frac{1}{6} \cdot \frac{2}{2} \\ = \frac{9}{12} + \frac{2}{12} = \boxed{\frac{11}{12}}$$

$$17) -\frac{2}{5} + \frac{1}{12} \\ = -\frac{2}{5} \cdot \frac{12}{12} + \frac{1}{12} \cdot \frac{5}{5} \\ = -\frac{24}{60} + \frac{5}{60} = \boxed{-\frac{19}{60}}$$

Exercise 2.3 continued

$$\begin{aligned} 18) \quad \frac{2}{3} - \frac{1}{6} &= \frac{2}{3} \cdot \frac{2}{2} - \frac{1}{6} \\ &= \frac{4}{6} - \frac{1}{6} \\ &= \frac{3}{6} \\ &= \boxed{\frac{1}{2}} \end{aligned}$$

$$\begin{aligned} 19) \quad 5 + 3\frac{2}{5} \\ &= \frac{5}{1} + \frac{17}{5} = \frac{5 \cdot 5}{1 \cdot 5} + \frac{17}{5} \\ &= \frac{25}{5} + \frac{17}{5} \\ &= \boxed{\frac{42}{5} \text{ or } 8\frac{2}{5}} \end{aligned}$$

$$\begin{aligned} 20) \quad 3 - 5\frac{2}{3} \\ &= \frac{3}{1} - \frac{17}{3} = \frac{3 \cdot 3}{1 \cdot 3} - \frac{17}{3} \\ &= \frac{9}{3} - \frac{17}{3} \\ &= \boxed{-\frac{8}{3} \text{ or } -2\frac{2}{3}} \end{aligned}$$

$$\begin{aligned} 21) \quad 6\frac{2}{5} + 2\frac{2}{3} \\ &= \frac{32}{5} + \frac{8}{3} = \frac{32 \cdot 3}{5 \cdot 3} + \frac{8 \cdot 5}{3 \cdot 5} \\ &= \frac{96}{15} + \frac{40}{15} \\ &= \boxed{\frac{136}{15} \text{ or } 9\frac{1}{15}} \end{aligned}$$

$$\begin{aligned} 22) \quad -5\frac{1}{2} + 2\frac{3}{5} \\ &= -\frac{11}{2} + \frac{13}{5} \\ &= -\frac{11 \cdot 5}{2 \cdot 5} + \frac{13 \cdot 2}{5 \cdot 2} \\ &= \frac{-55}{10} + \frac{26}{10} \\ &= \boxed{-\frac{19}{10} \text{ or } -1\frac{9}{10}} \end{aligned}$$

$$\begin{aligned} 23) \quad 2\frac{1}{5} - 6 &= \frac{11}{5} - \frac{6}{1} \\ &= \frac{11}{5} - \frac{6 \cdot 5}{1 \cdot 5} \\ &= \frac{11}{5} - \frac{30}{5} = \boxed{-\frac{19}{5} \text{ or } -3\frac{4}{5}} \end{aligned}$$

$$\begin{aligned} 24) \quad -2\frac{2}{7} - 4\frac{5}{6} \\ &= -\frac{16}{7} - \frac{29}{6} \\ &= -\frac{16 \cdot 6}{7 \cdot 6} - \frac{29 \cdot 7}{6 \cdot 7} \\ &= -\frac{96}{42} - \frac{203}{42} = \boxed{-\frac{299}{42} \text{ or } -7\frac{5}{42}} \end{aligned}$$

$$\begin{aligned} 25) \quad P &= 2\frac{1}{4}m + 5m + 5m + 2\frac{1}{4}m \\ &= \frac{9}{4}m + 10m + \frac{9}{4}m \\ &= \frac{18}{4}m + 10m \\ &= \frac{18}{4}m + \frac{40}{4}m = \boxed{\frac{58}{4}m \text{ or } 14\frac{2}{4}m} \\ &\quad 14\frac{1}{2}m \end{aligned}$$

$$\begin{aligned} 26) \quad 3in + 5\frac{1}{4}in + 2in + 2\frac{2}{3}in \\ &= 5in + \frac{21}{4}in + \frac{8}{3}in \\ &= \frac{5 \cdot 12}{1 \cdot 12}in + \frac{21 \cdot 3}{4 \cdot 3}in + \frac{8 \cdot 4}{3 \cdot 4}in \\ &= \frac{60}{12}in + \frac{63}{12}in + \frac{32}{12}in \\ &= \boxed{\frac{155}{12}in \text{ or } 12\frac{11}{12}in} \end{aligned}$$