

LÖSUNGEN

1.)

$$1) a) \frac{45}{75} = \frac{9}{15} = \frac{3}{5} \quad b) \frac{88}{132} = \frac{44}{66} = \frac{22}{33} = \frac{2}{3} \quad c) \frac{96}{168} = \frac{32}{56} = \frac{16}{28} = \frac{8}{14} = \frac{4}{7}$$

$$d) \frac{130}{52} = \frac{5}{2} \quad e) \frac{3420}{1440} = \frac{1140}{480} = \frac{380}{160} = \frac{19}{8}$$

2.)

$$(a) \frac{3}{4} = \frac{36}{48} \quad (b) \frac{7}{5} = \frac{56}{40} \quad (c) \frac{5}{12} = \frac{100}{240} \quad (d) \frac{3}{8} = \frac{375}{1000} \quad (e) \frac{16}{35} = \frac{352}{770}$$

3.)

$$3) a) 1\frac{2}{5} + 2\frac{2}{3} = 1\frac{6}{15} + 2\frac{10}{15} = \frac{21}{15} + \frac{40}{15} = \frac{61}{15} = 4\frac{1}{15}$$

$$b) 3\frac{2}{3} + 4\frac{5}{6} = \frac{11}{3} + \frac{29}{6} = \frac{22}{6} + \frac{29}{6} = \frac{51}{6} = \frac{17}{2} = 8\frac{1}{2}$$

$$c) 8\frac{5}{9} - 3\frac{1}{6} = \frac{77}{9} - \frac{19}{6} = \frac{154}{18} - \frac{57}{18} = \frac{97}{18} = 5\frac{7}{18}$$

$$d) 5\frac{1}{12} - 3\frac{3}{4} = \frac{61}{12} - \frac{15}{4} = \frac{61}{12} - \frac{45}{12} = \frac{16}{12} = \frac{4}{3} = 1\frac{1}{3}$$

$$e) \frac{3}{4} + \frac{1}{2} - \frac{5}{6} = \frac{18}{24} + \frac{12}{24} - \frac{20}{24} = \frac{10}{24} = \frac{5}{12}$$

$$f) 2\frac{3}{7} + 1\frac{1}{2} - \frac{5}{14} = \frac{17}{7} + \frac{3}{2} - \frac{5}{14} = \frac{34}{14} + \frac{21}{14} - \frac{5}{14} = \frac{55}{14} - \frac{5}{14} = \frac{50}{14} = \frac{25}{7} = 3\frac{4}{7}$$

$$g) 5\frac{1}{2} - 3\frac{2}{9} + 1\frac{1}{6} = \frac{11}{2} - \frac{29}{9} + \frac{7}{6} = \frac{99}{18} - \frac{58}{18} + \frac{21}{18} = \frac{41}{18} + \frac{21}{18} = \frac{62}{18} = \frac{31}{9} = 3\frac{4}{9}$$

$$h) 1\frac{4}{25} - \frac{1}{2} + 2\frac{3}{10} = \frac{29}{25} - \frac{1}{2} + \frac{23}{10} = \frac{58}{50} - \frac{25}{50} + \frac{115}{50} = \frac{33}{50} + \frac{115}{50} = \frac{148}{50} = \frac{74}{25}$$

4.)a)

$$4) a) 2\frac{3}{4} - 1\frac{2}{5} + 1\frac{2}{3} + 2\frac{1}{6} = \frac{11}{4} - \frac{7}{5} + \frac{5}{3} + \frac{13}{6} = \frac{11}{4} - \frac{7}{3} + \frac{13}{6} = \frac{33}{12} - \frac{28}{12} + \frac{26}{12} = \frac{5}{12} + \frac{26}{12} = \frac{31}{12} = 2\frac{7}{12}$$

b)

$$\begin{aligned} \text{b) } & \left(2\frac{3}{4} - 1\frac{2}{5}\right) \cdot 1\frac{2}{3} + 2\frac{1}{6} \cdot \left(\frac{11}{4} - \frac{7}{5}\right) \cdot \frac{5}{3} + \frac{13}{6} = \left(\frac{55}{20} - \frac{28}{20}\right) \cdot \frac{5}{3} + \frac{13}{6} = \\ & = \frac{27}{20} \cdot \frac{5}{3} + \frac{13}{6} = \frac{9}{4} + \frac{13}{6} = \frac{27}{12} + \frac{26}{12} = \frac{53}{12} = 4\frac{5}{12} \end{aligned}$$

c)

$$\begin{aligned} \text{c) } & 3\frac{1}{3} - 1\frac{1}{5} \cdot \left(1\frac{3}{8} + \frac{1}{2}\right) = \frac{10}{3} - \frac{6}{5} \cdot \left(\frac{11}{8} + \frac{1}{2}\right) = \frac{10}{3} - \frac{6}{5} \cdot \left(\frac{11}{8} + \frac{4}{8}\right) = \\ & = \frac{10}{3} - \frac{6}{5} \cdot \frac{15}{8} = \frac{10}{3} - \frac{9}{4} = \frac{40}{12} - \frac{27}{12} = \frac{13}{12} = 1\frac{1}{12} \end{aligned}$$

d)

$$\begin{aligned} \text{d) } & \left(3\frac{1}{3} - 1\frac{1}{5}\right) \cdot \left(1\frac{3}{8} + \frac{1}{2}\right) = \left(\frac{10}{3} - \frac{6}{5}\right) \cdot \left(\frac{11}{8} + \frac{1}{2}\right) = \left(\frac{50}{15} - \frac{18}{15}\right) \cdot \left(\frac{11}{8} + \frac{4}{8}\right) = \\ & = \frac{32}{15} \cdot \frac{15}{8} = 4 \end{aligned}$$

e)

$$\begin{aligned} \text{e) } & \left(2\frac{1}{3} + 3\frac{1}{2}\right) \cdot \left(1\frac{1}{7} - \frac{1}{2}\right) = \left(\frac{7}{3} + \frac{7}{2}\right) \cdot \left(\frac{8}{7} - \frac{1}{2}\right) = \left(\frac{14}{6} + \frac{21}{6}\right) \cdot \left(\frac{16}{14} - \frac{7}{14}\right) = \\ & = \frac{35}{6} \cdot \frac{9}{14} = \frac{15}{4} = 3\frac{3}{4} \end{aligned}$$

f)

$$\begin{aligned} \text{f) } & \left(2\frac{1}{3} + 3\frac{1}{2}\right) \cdot 1\frac{1}{7} - \frac{1}{2} = \left(\frac{7}{3} + \frac{7}{2}\right) \cdot \frac{8}{7} - \frac{1}{2} = \left(\frac{14}{6} + \frac{21}{6}\right) \cdot \frac{8}{7} - \frac{1}{2} = \\ & = \frac{35}{6} \cdot \frac{8}{7} - \frac{1}{2} = \frac{10}{3} - \frac{1}{2} = \frac{20}{6} - \frac{3}{6} = \frac{17}{6} = 2\frac{5}{6} \end{aligned}$$

5.)a)

$$\begin{aligned} \text{5.)a) } & \left(2\frac{2}{3} \cdot 1\frac{3}{5} - \frac{4}{5} \cdot 1\frac{1}{3}\right) : 3\frac{1}{5} = \left(\frac{8}{3} \cdot \frac{8}{5} - \frac{4}{5} \cdot \frac{4}{3}\right) : \frac{16}{5} = \\ & = \left(\frac{64}{15} - \frac{16}{15}\right) : \frac{16}{5} = \left(\frac{64}{15} - \frac{16}{15}\right) : \frac{16}{5} = \frac{48}{15} \cdot \frac{5}{16} = 1 \end{aligned}$$

b)

$$\begin{aligned} b) & \left(4\frac{2}{3} - 1\frac{3}{4}\right) \cdot 1\frac{3}{7} - 2\frac{1}{2} : \frac{3}{5} = \left(\frac{14}{3} - \frac{7}{4}\right) \cdot \frac{10}{7} - \frac{5}{2} : \frac{3}{5} = \\ & -\left(\frac{56}{12} - \frac{21}{12}\right) \cdot \frac{40}{7} - \frac{5}{2} : \frac{3}{5} = \frac{35}{12} : \frac{7}{4} - \frac{5}{2} : \frac{3}{5} = \frac{25}{6} - \frac{5}{2} \cdot \frac{5}{3} = \frac{25}{6} - \frac{25}{6} \\ & = \underline{0} \end{aligned}$$

c)

$$\begin{aligned} c) & 4\frac{3}{8} - 1\frac{3}{22} : 3\frac{3}{11} + 2\frac{1}{7} \cdot \frac{7}{12} = \frac{35}{8} - \frac{27}{22} : \frac{36}{11} + \frac{15}{7} \cdot \frac{7}{12} = \\ & = \frac{35}{8} - \frac{27}{22} \cdot \frac{11}{36} + \frac{15}{7} \cdot \frac{7}{12} = \frac{35}{8} - \frac{3}{8} + \frac{5}{4} \cdot \frac{35}{8} - \frac{3}{8} + \frac{10}{8} = \frac{32}{8} + \frac{10}{8} = \\ & = \frac{42}{8} = \frac{21}{4} = \underline{5\frac{1}{4}} \end{aligned}$$

d)

$$\begin{aligned} d) & \left(4\frac{1}{5} - 1\frac{2}{7}\right) \cdot \frac{5}{6} + \left(3\frac{1}{2} + 1\frac{2}{9}\right) : \frac{5}{18} = \left(\frac{21}{5} - \frac{9}{7}\right) \cdot \frac{5}{6} + \left(\frac{7}{2} + \frac{11}{9}\right) : \frac{5}{18} = \\ & = \left(\frac{147}{35} - \frac{45}{35}\right) \cdot \frac{5}{6} + \left(\frac{63}{18} + \frac{22}{18}\right) : \frac{5}{18} = \frac{102}{35} \cdot \frac{5}{6} + \frac{85}{18} : \frac{5}{18} = \frac{17}{7} + \frac{17}{1} = \\ & = \frac{17}{7} + \frac{119}{7} = \frac{136}{7} = \underline{19\frac{2}{7}} \end{aligned}$$

e)

$$\begin{aligned} e) & 10\frac{2}{3} - \left(4\frac{2}{5} - 1\frac{7}{10}\right) : \left(2\frac{2}{5} - 1\frac{1}{2}\right) = \frac{32}{3} - \left(\frac{22}{5} - \frac{17}{10}\right) : \left(\frac{12}{5} - \frac{3}{2}\right) = \\ & = \frac{32}{3} - \left(\frac{44}{10} - \frac{17}{10}\right) : \left(\frac{24}{10} - \frac{15}{10}\right) = \frac{32}{3} - \frac{27}{10} : \frac{9}{10} = \frac{32}{3} - \frac{27}{10} \cdot \frac{10}{9} = \\ & = \frac{32}{3} - \frac{3}{1} = \frac{32}{3} - \frac{9}{3} = \frac{23}{3} = \underline{7\frac{2}{3}} \end{aligned}$$

f)

$$\begin{aligned} f) & 7\frac{1}{2} - \left(3\frac{1}{5} : 2\frac{2}{15} + 1\frac{3}{4} \cdot 1\frac{3}{7}\right) = \frac{15}{2} - \left(\frac{16}{5} : \frac{32}{15} + \frac{7}{4} \cdot \frac{10}{7}\right) = \\ & = \frac{15}{2} - \left(\frac{16}{5} \cdot \frac{15}{32} + \frac{7}{4} \cdot \frac{10}{7}\right) = \frac{15}{2} - \left(\frac{3}{2} + \frac{5}{2}\right) = \frac{15}{2} - \frac{8}{2} = \\ & = \frac{7}{2} = \underline{3\frac{1}{2}} \end{aligned}$$