

Übungsarbeit zur Bruchrechnung

Berechne ohne Taschenrechner:

1) $\frac{3}{5} + \frac{1}{8} + \frac{17}{20} + \frac{3}{4} + \frac{1}{2}$ 2) $\frac{51}{16} - \frac{1}{8} - \frac{3}{4} - \frac{1}{2}$ 3) $\frac{4}{7} + \frac{3}{28} + \frac{2}{3} - \frac{3}{4}$

4) $\frac{12}{7} + \frac{18}{72} - \frac{20}{36} - \frac{7}{12} + \frac{5}{6} - \frac{2}{3} + \frac{7}{9} - \frac{3}{8}$

5) $3\frac{1}{2} + 4\frac{3}{5} - 6\frac{11}{14} + \frac{29}{35} - \frac{9}{10} + 2\frac{29}{35} + 1\frac{3}{7}$

6) $\frac{432}{576} \cdot \frac{95}{133}$

7) $\frac{41}{118} \cdot \frac{59}{205}$

8) $\frac{81}{243} \cdot \frac{27}{18}$

9) $\frac{32}{64} \cdot \frac{17}{49} \cdot \frac{13}{11} \cdot \frac{98}{17} \cdot \frac{22}{39} \cdot \frac{33}{77} \cdot \frac{16}{64}$

10) $\frac{45}{46} \cdot \frac{126}{414} \cdot \frac{23}{10} \cdot \frac{2317}{4011} \cdot \frac{4011}{2317} \cdot \frac{21}{27}$

11) $3\frac{3}{4} \cdot 4\frac{7}{9}$

12) $6\frac{4}{7} \cdot 5\frac{11}{23}$

13) $2\frac{1}{3} \cdot 5\frac{5}{6}$

14) $1\frac{8}{17} \cdot 1\frac{38}{117} \cdot 6\frac{4}{5} \cdot 1\frac{8}{31}$

15) $\frac{2}{3} : \frac{4}{5}$

16) $\frac{4}{5} : \frac{2}{3}$

17) $\frac{9}{11} : \frac{36}{17}$

18) $\left(\frac{12}{16} : \frac{54}{81}\right) : \left(\frac{48}{114} : \frac{24}{798}\right)$

19) $\left(12\frac{1}{4} : \frac{7}{12}\right) : \left(3\frac{5}{6} : 7\frac{7}{27}\right)$

20) $\frac{29}{3} + \frac{4}{6} \cdot \frac{5}{10} \cdot \frac{125}{625} - \frac{103}{515} \cdot \frac{67}{31} \cdot \frac{62}{268}$

21) $\left(4\frac{7}{12} - 2\frac{1}{6}\right) \cdot \left(3\frac{5}{9} - 2\frac{3}{4}\right) + \frac{39}{72} : 1\frac{5}{8}$

22) $\left(1\frac{2}{3} : 4\frac{1}{2}\right)^3 + 7\frac{1}{4} \cdot 3\frac{5}{9} - 4\frac{17}{36} + \left(1\frac{1}{2}\right)^5$

23) $15\frac{2}{3} - \left[6\frac{1}{2} \left(2\frac{1}{4} - \frac{7}{8}\right) + \frac{3}{4}\right] : 6$

24) $\left(3\frac{1}{8} - 2\frac{3}{4}\right)^2 + \frac{5}{2} + \frac{3}{8} + \frac{1}{2} \left(\frac{3}{2} : \frac{6}{8}\right)^2$

25) $12 \cdot 14 - 7\frac{1}{2} \cdot 5 + 6\frac{1}{3} \left(3 - \frac{1}{2}\right)^3$



Lösungen

$$1) \frac{3}{5} + \frac{1}{8} + \frac{17}{20} + \frac{3}{4} + \frac{1}{2} = \frac{24}{40} + \frac{5}{40} + \frac{34}{40} + \frac{30}{40} + \frac{20}{40} = \frac{113}{40} = \underline{\underline{2\frac{33}{40}}}$$

$$2) \frac{51}{16} - \frac{1}{8} - \frac{3}{4} - \frac{1}{2} = \frac{51}{16} - \frac{2}{16} - \frac{12}{16} - \frac{8}{16} = \frac{29}{16} = \underline{\underline{1\frac{13}{16}}}$$

$$3) \frac{4}{7} + \frac{3}{28} + \frac{2}{3} - \frac{3}{4} = \frac{48}{84} + \frac{9}{84} + \frac{56}{84} - \frac{63}{84} = \frac{50}{84} = \underline{\underline{\frac{25}{42}}}$$

$$4) \frac{12}{7} + \frac{18}{72} - \frac{20}{36} - \frac{7}{12} + \frac{5}{6} - \frac{2}{3} + \frac{7}{9} - \frac{3}{8} =$$
$$\frac{864}{504} + \frac{126}{504} - \frac{280}{504} - \frac{294}{504} + \frac{420}{504} - \frac{336}{504} + \frac{392}{504} - \frac{189}{504} =$$
$$\frac{1802}{504} - \frac{1099}{504} = \frac{703}{504} = \underline{\underline{1\frac{199}{504}}}$$

$$5) 3\frac{1}{2} + 4\frac{3}{5} - 6\frac{11}{14} + \frac{29}{35} - \frac{9}{10} + 2\frac{29}{35} + 1\frac{3}{7} =$$
$$\frac{7}{2} + \frac{23}{5} - \frac{95}{14} + \frac{29}{35} - \frac{9}{10} + \frac{99}{35} + \frac{10}{7} =$$
$$\frac{245}{70} + \frac{322}{70} - \frac{475}{70} + \frac{58}{70} - \frac{63}{70} + \frac{198}{70} + \frac{100}{70} =$$
$$\frac{923}{70} - \frac{538}{70} = \frac{385}{70} = 5\frac{35}{70} = \underline{\underline{5\frac{1}{2}}}$$

$$6) \frac{432}{576} \cdot \frac{95}{133} = \frac{108}{144} \cdot \frac{5}{7} = \frac{27}{36} \cdot \frac{5}{7} = \frac{3}{4} \cdot \frac{5}{7} = \underline{\underline{\frac{15}{28}}}$$

$$7) \frac{41}{118} \cdot \frac{59}{205} = \frac{1}{2} \cdot \frac{1}{5} = \underline{\underline{\frac{1}{10}}}$$

$$8) \frac{81}{243} \cdot \frac{27}{18} = \frac{1}{3} \cdot \frac{1}{2} = \frac{1}{1} \cdot \frac{1}{2} = \underline{\underline{\frac{1}{2}}}$$

$$9) \frac{32}{64} \cdot \frac{17}{49} \cdot \frac{13}{11} \cdot \frac{98}{17} \cdot \frac{22}{39} \cdot \frac{33}{77} \cdot \frac{16}{64} = \frac{1}{2} \cdot \frac{17}{49} \cdot \frac{13}{11} \cdot \frac{98}{17} \cdot \frac{22}{39} \cdot \frac{3}{7} \cdot \frac{1}{4} =$$
$$\frac{1}{2} \cdot \frac{1}{1} \cdot \frac{1}{1} \cdot \frac{1}{1} \cdot \frac{1}{3} \cdot \frac{3}{7} \cdot \frac{1}{1} =$$
$$\frac{3}{42} = \underline{\underline{\frac{1}{14}}}$$



$$\begin{aligned}
 \mathbf{10)} \quad \frac{15}{46} \cdot \frac{126}{414} \cdot \frac{23}{10} \cdot \frac{2317}{4011} \cdot \frac{4011}{2317} \cdot \frac{21}{27} &= \frac{15}{46} \cdot \frac{63}{207} \cdot \frac{23}{10} \cdot \frac{1}{1} \cdot \frac{1}{1} \cdot \frac{7}{9} = \\
 \frac{3}{2} \cdot \frac{7}{23} \cdot \frac{1}{2} \cdot \frac{1}{1} \cdot \frac{1}{1} \cdot \frac{7}{9} &= \frac{1}{2} \cdot \frac{7}{23} \cdot \frac{1}{2} \cdot \frac{1}{1} \cdot \frac{1}{1} \cdot \frac{7}{3} = \underline{\underline{\frac{47}{276}}}
 \end{aligned}$$

$$\mathbf{11)} \quad 3\frac{3}{4} \cdot 4\frac{7}{9} = \frac{15}{4} \cdot \frac{43}{9} = \frac{5}{4} \cdot \frac{43}{3} = \frac{215}{12} = \underline{\underline{17\frac{11}{12}}}$$

$$\mathbf{12)} \quad 6\frac{4}{7} \cdot 5\frac{11}{23} = \frac{46}{7} \cdot \frac{126}{23} = \frac{2}{1} \cdot \frac{18}{1} = \underline{\underline{36}}$$

$$\mathbf{13)} \quad 2\frac{1}{3} \cdot 5\frac{5}{6} = \frac{7}{3} \cdot \frac{25}{6} = \frac{245}{18} = \underline{\underline{13\frac{11}{18}}}$$

$$\begin{aligned}
 \mathbf{14)} \quad 1\frac{8}{17} \cdot 1\frac{38}{117} \cdot 6\frac{4}{5} \cdot 1\frac{8}{31} &= \frac{25}{17} \cdot \frac{155}{117} \cdot \frac{34}{5} \cdot \frac{39}{31} = \\
 \frac{5}{1} \cdot \frac{5}{3} \cdot \frac{2}{1} \cdot \frac{1}{1} &= \frac{50}{3} = \underline{\underline{16\frac{2}{3}}}
 \end{aligned}$$

$$\mathbf{15)} \quad \frac{2}{3} : \frac{4}{5} = \frac{2}{3} \cdot \frac{5}{4} = \frac{1}{3} \cdot \frac{5}{2} = \underline{\underline{\frac{5}{6}}}$$

$$\mathbf{16)} \quad \frac{4}{5} : \frac{2}{3} = \frac{4}{5} \cdot \frac{3}{2} = \frac{2}{5} \cdot \frac{3}{1} = \underline{\underline{1\frac{1}{5}}}$$

$$\mathbf{17)} \quad \frac{9}{11} : \frac{36}{77} = \frac{9}{11} \cdot \frac{77}{36} = \frac{1}{1} \cdot \frac{7}{4} = \frac{7}{4} = \underline{\underline{1\frac{3}{4}}}$$

$$\begin{aligned}
 \mathbf{18)} \quad \left(\frac{12}{16} : \frac{54}{81}\right) : \left(\frac{48}{114} : \frac{24}{798}\right) &= \left(\frac{3}{4} : \frac{2}{3}\right) : \left(\frac{8}{19} : \frac{4}{133}\right) = \left(\frac{3}{4} \cdot \frac{3}{2}\right) : \left(\frac{8}{19} \cdot \frac{133}{4}\right) = \\
 \frac{9}{8} : \left(\frac{2}{1} \cdot \frac{7}{1}\right) &= \frac{9}{8} : \frac{14}{1} = \frac{9}{8} \cdot \frac{1}{14} = \underline{\underline{\frac{9}{112}}}
 \end{aligned}$$

$$\begin{aligned}
 \mathbf{19)} \quad \left(12\frac{1}{4} : \frac{7}{12}\right) : \left(3\frac{5}{6} : 7\frac{7}{27}\right) &= \left(\frac{49}{4} : \frac{7}{12}\right) : \left(\frac{23}{6} : \frac{196}{27}\right) = \left(\frac{49}{4} \cdot \frac{12}{7}\right) : \left(\frac{23}{6} \cdot \frac{27}{196}\right) = \\
 \left(\frac{7}{1} \cdot \frac{3}{1}\right) : \left(\frac{23}{2} \cdot \frac{9}{196}\right) &= \frac{21}{1} : \frac{207}{392} = \frac{21}{1} \cdot \frac{392}{207} = \\
 \frac{7}{1} \cdot \frac{392}{69} &= \frac{2744}{69} = \underline{\underline{39\frac{53}{69}}}
 \end{aligned}$$



$$\begin{aligned}
 \mathbf{20)} \quad \frac{29}{3} + \frac{4}{6} \cdot \frac{5}{10} \cdot \frac{125}{625} - \frac{103}{515} \cdot \frac{67}{31} \cdot \frac{62}{268} &= \frac{29}{3} + \frac{2}{3} \cdot \frac{1}{2} \cdot \frac{1}{5} - \frac{1}{5} \cdot \frac{1}{1} \cdot \frac{2}{4} = \\
 \frac{29}{3} + \frac{2}{30} - \frac{2}{20} &= \frac{29}{3} + \frac{1}{15} - \frac{1}{10} = \frac{290}{30} + \frac{2}{30} - \frac{3}{30} = \frac{289}{30} = \underline{\underline{9\frac{19}{30}}}
 \end{aligned}$$

$$\begin{aligned}
 \mathbf{21)} \quad \left(4\frac{7}{12} - 2\frac{1}{6}\right) \cdot \left(3\frac{5}{9} - 2\frac{3}{4}\right) + \frac{39}{72} : 1\frac{5}{8} &= \left(\frac{55}{12} - \frac{13}{6}\right) \cdot \left(\frac{32}{9} - \frac{11}{4}\right) + \frac{13}{24} : \frac{13}{8} = \\
 \left(\frac{55}{12} - \frac{26}{6}\right) \cdot \left(\frac{128}{36} - \frac{99}{36}\right) + \frac{13}{24} \cdot \frac{8}{13} &= \frac{29}{12} \cdot \frac{29}{36} + \frac{1}{3} \cdot \frac{1}{1} = \\
 \frac{841}{432} + \frac{144}{432} &= \frac{985}{432} = \underline{\underline{2\frac{121}{432}}}
 \end{aligned}$$

$$\begin{aligned}
 \mathbf{22)} \quad \left(1\frac{2}{3} : 4\frac{1}{2}\right)^3 + 7\frac{1}{4} \cdot 3\frac{5}{9} - 4\frac{17}{36} + \left(1\frac{1}{2}\right)^5 &= \left(\frac{5}{3} : \frac{9}{2}\right)^3 + \frac{29}{4} \cdot \frac{32}{9} - \frac{161}{36} + \left(\frac{3}{2}\right)^5 = \\
 \left(\frac{5}{3} \cdot \frac{2}{9}\right)^3 + \frac{928}{36} - \frac{161}{36} + \frac{243}{32} &= \left(\frac{10}{27}\right)^3 + \frac{137}{36} + \frac{243}{32} = \\
 \frac{1000}{19638} + \frac{137}{36} + \frac{243}{32} &= \frac{32000}{629856} + \frac{2396952}{629856} + \frac{4782969}{629856} = \\
 \frac{7211921}{629856} &= 11\frac{233505}{629856} = \\
 \underline{\underline{11\frac{25945}{69984}}} &
 \end{aligned}$$

$$\begin{aligned}
 \mathbf{23)} \quad 15\frac{2}{3} - \left[6\frac{1}{2} \left(2\frac{1}{4} - \frac{7}{8}\right) + \frac{3}{4}\right] \cdot \frac{1}{6} &= \frac{47}{3} - \left[\frac{13}{2} \left(\frac{18}{8} - \frac{7}{8}\right) + \frac{3}{4}\right] \cdot \frac{1}{6} = \\
 \frac{47}{3} - \left[\frac{13}{2} \cdot \frac{11}{8} + \frac{12}{16}\right] \cdot \frac{1}{6} &= \frac{47}{3} - \frac{155}{16} \cdot \frac{1}{6} = \\
 \frac{1504}{96} - \frac{155}{96} &= \frac{1349}{96} = \underline{\underline{14\frac{5}{96}}}
 \end{aligned}$$

$$\begin{aligned}
 \mathbf{24)} \quad \left(3\frac{1}{8} - 2\frac{3}{4}\right)^2 + \frac{5}{2} + \frac{3}{8} + \frac{1}{2} \left(\frac{3}{2} : \frac{6}{8}\right)^2 &= \left(\frac{25}{8} - \frac{22}{8}\right)^2 + \frac{20}{8} + \frac{3}{8} + \frac{1}{2} \left(\frac{3}{2} \cdot \frac{8}{6}\right)^2 = \\
 \left(\frac{3}{8}\right)^2 + \frac{23}{8} + \frac{1}{2} \left(\frac{1}{1} \cdot \frac{4}{2}\right)^2 &= \frac{9}{64} + \frac{184}{64} + \frac{1}{2} \cdot 4 = \\
 \frac{193}{64} + 2 &= 3\frac{1}{64} + 2 = \underline{\underline{5\frac{1}{64}}}
 \end{aligned}$$



$$\begin{aligned}
 \mathbf{25)} \quad 12 \cdot 14 - 7\frac{1}{2} \cdot 5 + 6\frac{1}{3} \cdot \left(3 - \frac{1}{2}\right)^3 &= 168 - \frac{15}{2} \cdot \frac{5}{1} + \frac{19}{3} \cdot \left(\frac{5}{2}\right)^3 = \\
 168 - \frac{15}{2} \cdot \frac{5}{1} + \frac{19}{3} \cdot \left(\frac{5}{2}\right)^3 &= 168 - \frac{75}{2} + \frac{19}{3} \cdot \frac{125}{8} = \\
 \frac{4032}{24} - \frac{900}{24} + \frac{2375}{24} &= \frac{5507}{24} = \\
 \underline{\underline{229\frac{11}{24}}} &
 \end{aligned}$$



IMMER GANZ
COOL
 BLEIBEN
 Mathe. ist doch
TURBO-EASY

