

Aufgabe 1.1

Addieren bzw. subtrahieren Sie die folgenden Brüche:

a) $\frac{1}{2} - \frac{5}{6} + \frac{3}{8} - 3$

e) $\frac{7}{8} + \frac{14}{5} - 3 - \frac{1}{10}$

b) $\frac{7}{6} - \frac{2}{3} + 2 + \frac{3}{4}$

f) $\frac{2}{3} - \frac{5}{12} + \frac{5}{6} - \frac{5}{18}$

c) $\frac{3}{8} + \frac{7}{4} + \frac{16}{9} - 2$

g) $\frac{4}{3} - \frac{2}{5} + \frac{1}{30} - \frac{7}{10}$

d) $\frac{5}{3} + \frac{3}{7} + 3 - \frac{15}{21}$

h) $\frac{1}{5} + 0,7 + \frac{3}{20} - \frac{1}{2}$

Aufgabe 1.2

Berechnen Sie die exakte Lösung:

a) $\frac{3}{2} \cdot \left(\frac{5}{3} + \frac{9}{4} \right) + \frac{17}{8}$

e) $\frac{6}{5} \cdot \frac{10}{3} + \frac{3}{4} - \frac{12}{5} \cdot \frac{15}{3}$

b) $\frac{5}{7} \cdot \frac{4}{15} + \frac{2}{3} \cdot \left(\frac{15}{7} + \frac{3}{21} \right) - \frac{5}{7}$

f) $\frac{13}{6} - 2 \cdot \frac{13}{4} + \frac{15}{12}$

c) $\frac{11}{3} \cdot \left(\frac{15}{22} + \frac{13}{44} \right) - \frac{17}{8} + \frac{13}{24}$

g) $\frac{15}{4} + 14 \cdot \frac{3}{7} - \frac{17}{3} + 1$

d) $\frac{14}{5} + \frac{1}{2} \cdot \left(\frac{5}{10} - \frac{1}{5} \right) - 3 + \frac{1}{20}$

h) $\frac{18}{7} + \frac{17}{7} \cdot \frac{14}{3} + \frac{1}{21}$

Aufgabe 1.3

Berechnen Sie die exakte Lösung:

a) $3 + 4 - \frac{1}{2} + 5 - \frac{1}{6}$

g) $\frac{14 \cdot (7+3)}{5} + \frac{3}{4} - \frac{15}{7} \cdot \frac{8}{5}$

b) $-3 + 5 - \frac{36}{7}$

h) $-3(3+5) + \frac{3}{8}(-4+3)$

c) $-\frac{15}{3} - 10 + 20 - \frac{18}{4} - \frac{1}{2}$

i) $\frac{14}{5} \cdot \frac{1}{4+8} - \frac{4(15-3)}{28 \cdot 7} + \frac{3}{15} \left(\frac{1}{8} - \frac{5}{3} \right)$

d) $4 \cdot 8 - 3 \cdot (5+7) + \frac{1}{3}$

j) $-3 \cdot \left(-\frac{1}{4} \right) + \frac{5 \cdot 4}{8 \cdot 9} - \frac{17}{6} \left(-\frac{1}{3} + 5 \left(8 - \frac{1}{4} \right) \right)$

e) $-10 + (-8+5) - \frac{15}{20} \cdot 4 \cdot \frac{8}{3}$

k) $-3 \div \frac{15}{8} + \frac{1}{15} \left(-\frac{38}{7} \right) - \frac{1+4}{\frac{1}{8} - \frac{1}{16}}$

f) $3 + 18 - \frac{25}{7} + \frac{3+5}{8}$

l) $4 \div \left(\frac{-14 \cdot 3}{17+5} \right) \cdot \left(-\frac{1}{4} \right) + 18 - \frac{5}{7+6} \cdot 13$

Aufgabe 1.1

$$a) \frac{1}{2} - \frac{5}{6} + \frac{3}{8} - 3 = \dots \rightarrow \frac{12}{24} - \frac{20}{24} + \frac{9}{24} - \frac{72}{24} = \dots \rightarrow \underline{\underline{\frac{71}{24}}}$$

$$b) \frac{7}{6} - \frac{2}{3} + 2 + \frac{3}{4} = \dots \rightarrow \frac{14}{12} - \frac{8}{12} + \frac{24}{12} + \frac{9}{12} = \dots \rightarrow \frac{39}{12} = \dots \rightarrow \underline{\underline{\frac{13}{4}}}$$

$$c) \frac{3}{8} + \frac{7}{4} + \frac{16}{9} - 2 = \dots \rightarrow \frac{27}{72} + \frac{126}{72} + \frac{128}{72} - \frac{144}{72} = \dots \rightarrow \underline{\underline{\frac{137}{72}}}$$

$$d) \frac{5}{3} + \frac{3}{7} + 3 - \frac{15}{21} = \dots \rightarrow \frac{35}{21} + \frac{9}{21} + \frac{63}{21} - \frac{15}{21} = \dots \rightarrow \underline{\underline{\frac{92}{21}}}$$

$$e) \frac{7}{8} + \frac{14}{5} - 3 - \frac{1}{10} = \dots \rightarrow \frac{35}{40} + \frac{112}{40} - \frac{120}{40} - \frac{4}{40} = \dots \rightarrow \underline{\underline{\frac{23}{40}}}$$

$$f) \frac{2}{3} - \frac{5}{12} + \frac{5}{6} - \frac{5}{18} = \dots \rightarrow \frac{24}{36} - \frac{15}{36} + \frac{30}{36} - \frac{10}{36} = \dots \rightarrow \underline{\underline{\frac{29}{36}}}$$

$$g) \frac{4}{3} - \frac{2}{5} + \frac{1}{30} - \frac{7}{10} = \dots \rightarrow \frac{40}{30} - \frac{12}{30} + \frac{1}{30} - \frac{21}{30} = \dots \rightarrow \frac{8}{30} = \dots \rightarrow \underline{\underline{\frac{4}{15}}}$$

$$h) \frac{1}{5} + 0,7 + \frac{3}{20} - \frac{1}{2} = \dots \rightarrow \frac{1}{5} + \frac{7}{10} + \frac{3}{20} - \frac{1}{2} = \dots \rightarrow \frac{4}{20} + \frac{14}{20} + \frac{3}{20} - \frac{10}{20} = \dots \rightarrow \underline{\underline{\frac{11}{20}}}$$

Aufgabe 1.2

$$\begin{aligned} \text{a) } \frac{3}{2} \cdot \left(\frac{5}{3} + \frac{9}{4} \right) + \frac{17}{8} &= \dots \rightarrow \frac{3}{2} \cdot \frac{5}{3} + \frac{3}{2} \cdot \frac{9}{4} + \frac{17}{8} = \dots \rightarrow \frac{5}{2} + \frac{27}{8} + \frac{17}{8} = \dots \\ \frac{20}{8} + \frac{27}{8} + \frac{17}{8} &= \dots \rightarrow \frac{64}{8} = \dots \rightarrow \underline{8} \end{aligned}$$

$$\begin{aligned} \text{b) } \frac{5}{7} \cdot \frac{4}{15} + \frac{2}{3} \cdot \left(\frac{15}{7} + \frac{3}{21} \right) - \frac{5}{7} &= \dots \rightarrow \frac{4}{21} + \frac{2}{3} \cdot \frac{15}{7} + \frac{2}{3} \cdot \frac{3}{21} - \frac{5}{21} = \dots \\ \frac{4}{21} + \frac{30}{21} + \frac{2}{21} - \frac{5}{21} &= \dots \rightarrow \frac{21}{21} = \dots \rightarrow \underline{1} \end{aligned}$$

$$\begin{aligned} \text{c) } \frac{11}{3} \cdot \left(\frac{15}{22} + \frac{13}{44} \right) - \frac{17}{8} + \frac{13}{24} &= \dots \rightarrow \frac{11}{3} \cdot \frac{15}{22} + \frac{11}{3} \cdot \frac{13}{44} - \frac{17}{8} + \frac{13}{24} = \dots \\ \frac{5}{2} + \frac{13}{12} - \frac{17}{8} + \frac{13}{24} &= \dots \rightarrow \frac{60}{24} + \frac{26}{24} - \frac{51}{24} + \frac{13}{24} = \dots \rightarrow \frac{48}{24} = \dots \rightarrow \underline{2} \end{aligned}$$

$$\begin{aligned} \text{d) } \frac{14}{5} + \frac{1}{2} \cdot \left(\frac{5}{10} - \frac{1}{5} \right) - 3 + \frac{1}{20} &= \dots \rightarrow \frac{14}{5} + \frac{5}{20} - \frac{1}{10} - 3 + \frac{1}{20} = \dots \\ \frac{56}{20} + \frac{5}{20} - \frac{2}{20} - \frac{60}{20} + \frac{1}{20} &= \dots \rightarrow \underline{0} \end{aligned}$$

$$\text{e) } \frac{6}{5} \cdot \frac{10}{3} + \frac{3}{4} - \frac{12}{5} \cdot \frac{15}{3} = \dots \rightarrow 4 + \frac{3}{4} - 12 = \dots \rightarrow \frac{3}{4} - 8 = \dots \rightarrow \frac{3}{4} - \frac{32}{4} = \dots \rightarrow \underline{-\frac{29}{4}}$$

$$\text{f) } \frac{13}{6} - 2 \cdot \frac{13}{4} + \frac{15}{12} = \dots \rightarrow \frac{13}{6} - \frac{13}{2} + \frac{15}{12} = \dots \rightarrow \frac{26}{12} - \frac{78}{12} + \frac{15}{12} = \dots \rightarrow \underline{-\frac{37}{12}}$$

$$\begin{aligned} \text{g) } \frac{15}{4} + 14 \cdot \frac{3}{7} - \frac{17}{3} + 1 &= \dots \rightarrow \frac{15}{4} + 6 - \frac{17}{3} + 1 = \dots \rightarrow \frac{15}{4} - \frac{17}{3} + 7 = \dots \\ \frac{45}{12} - \frac{68}{12} + \frac{84}{12} &= \dots \rightarrow \underline{\frac{61}{12}} \end{aligned}$$

$$\text{h) } \frac{18}{7} + \frac{17}{7} \cdot \frac{14}{3} + \frac{1}{21} = \dots \rightarrow \frac{54}{21} + \frac{238}{21} + \frac{1}{21} = \dots \rightarrow \underline{\frac{293}{21}}$$

Aufgabe 1.3

$$a) 3+4-\frac{1}{2}+5-\frac{1}{6}=\dots \rightarrow 12-\frac{3}{6}-\frac{1}{6}=\dots \rightarrow 12-\frac{4}{6}=\dots \rightarrow 12-\frac{2}{3}=\dots$$

$$\frac{36}{3}-\frac{2}{3}=\dots \rightarrow \frac{34}{3} ; 11,33$$

$$b) -3+5-\frac{36}{7}=\dots \rightarrow 2-\frac{36}{7}=\dots \rightarrow \frac{14}{7}-\frac{36}{7}=\dots \rightarrow \frac{-22}{7} ; -3,413$$

$$c) -\frac{15}{3}-10+20-\frac{18}{4}-\frac{1}{2}=\dots \rightarrow -\frac{60}{12}+10-\frac{54}{12}-\frac{6}{12}=\dots \rightarrow -\frac{120}{12}+10=\dots$$

$$-10+10=\dots \rightarrow 0$$

$$d) 4 \cdot 8-3 \cdot (5+7)+\frac{1}{3}=\dots \rightarrow 32-3 \cdot 12+\frac{1}{3}=\dots \rightarrow 32-36+\frac{1}{3}=\dots$$

$$-4+\frac{1}{3}=\dots \rightarrow -\frac{12}{3}+\frac{1}{3}=\dots \rightarrow \frac{-11}{3} ; -3,667$$

$$e) -10+(-8+5)-\frac{15}{20} \cdot 4 \cdot \frac{8}{3}=\dots \rightarrow -10-3-\frac{3}{4} \cdot 4 \cdot \frac{8}{3}=\dots \rightarrow -13-8=\dots \rightarrow -21$$

$$f) 3+18-\frac{25}{7}+\frac{3+5}{8}=\dots \rightarrow 21-\frac{25}{7}+\frac{8}{8}=\dots \rightarrow 21-\frac{25}{7}+1=\dots$$

$$22-\frac{25}{7}=\dots \rightarrow \frac{154}{7}-\frac{25}{7}=\dots \rightarrow \frac{129}{7} ; 18,43$$

$$g) \frac{14 \cdot (7+3)}{5}+\frac{3}{4}-\frac{15}{7} \cdot \frac{8}{5}=\dots \rightarrow \frac{14 \cdot 10}{5}+\frac{3}{4}-\frac{3}{7} \cdot \frac{8}{1}=\dots \rightarrow \frac{14 \cdot 2}{1}+\frac{3}{4}-\frac{24}{7}=\dots$$

$$28+\frac{3}{4}-\frac{24}{7}=\dots \rightarrow \frac{784}{28}+\frac{21}{28}-\frac{96}{28}=\dots \rightarrow \frac{709}{28} ; 25,32$$

$$h) -3(3+5)+\frac{3}{8}(-4+3)=\dots \rightarrow -3 \cdot 8+\frac{3}{8} \cdot (-1)=\dots \rightarrow -24-\frac{3}{8}=\dots$$

$$-\frac{192}{8}-\frac{3}{8}=\dots \rightarrow \frac{-195}{8} ; -24,375$$

$$i) \frac{14}{5} \cdot \frac{1}{4+8}-\frac{4(15-3)}{28 \cdot 7}+\frac{3}{15} \left(\frac{1}{8}-\frac{5}{3} \right)=\dots \rightarrow \frac{14}{5} \cdot \frac{1}{12}-\frac{12}{7 \cdot 7}+\frac{1}{5} \left(\frac{3}{24}-\frac{40}{24} \right)=\dots$$

$$\frac{7}{5} \cdot \frac{1}{6}-\frac{12}{49}+\frac{1}{5} \left(-\frac{37}{24} \right)=\dots \rightarrow \frac{1372}{5880}-\frac{1440}{5880}-\frac{1813}{5880}=\dots \rightarrow \frac{-1881}{5880}=\dots$$

$$-\frac{627}{1960} ; -0,3199$$

$$\begin{aligned}
 \text{j) } & -3 \cdot \left(-\frac{1}{4} \right) + \frac{5 \cdot 4}{8 \cdot 9} - \frac{17}{6} \left(-\frac{1}{3} + 5 \left(8 - \frac{1}{4} \right) \right) = \dots \rightarrow \frac{3}{4} + \frac{5 \cdot 1}{2 \cdot 9} - \frac{17}{6} \left(-\frac{1}{3} + 5 \left(\frac{32}{4} - \frac{1}{4} \right) \right) = \dots \\
 & \frac{3}{4} + \frac{5}{18} - \frac{17}{6} \left(-\frac{1}{3} + \frac{155}{4} \right) = \dots \rightarrow \frac{3}{4} + \frac{5}{18} - \frac{17}{6} \left(-\frac{4}{12} + \frac{465}{12} \right) = \dots \\
 & \frac{3}{4} + \frac{5}{18} - \frac{17}{6} \cdot \frac{461}{12} = \dots \rightarrow \frac{54}{72} + \frac{20}{72} - \frac{7837}{72} = \dots \rightarrow \frac{-7763}{72} ; -107,82
 \end{aligned}$$

$$\begin{aligned}
 \text{k) } & -3 \div \frac{15}{8} + \frac{1}{15} \left(-\frac{38}{7} \right) - \frac{1+4}{\frac{1}{8} - \frac{1}{16}} = \dots \rightarrow -3 \cdot \frac{8}{15} - \frac{38}{105} - \frac{5}{\frac{2}{16} - \frac{1}{16}} = \dots \\
 & -\frac{24}{15} - \frac{38}{105} - \frac{5}{\frac{1}{16}} = \dots \rightarrow -\frac{24}{15} - \frac{38}{105} - 80 = \dots \rightarrow -\frac{168}{105} - \frac{38}{105} - \frac{8400}{105} = \dots \\
 & \frac{-8606}{105} ; -81,96
 \end{aligned}$$

$$\begin{aligned}
 \text{l) } & 4 \div \left(\frac{-14 \cdot 3}{17+5} \right) \cdot \left(-\frac{1}{4} \right) + 18 - \frac{5}{7+6} \cdot 13 = \dots \rightarrow 4 \div \left(-\frac{42}{22} \right) \cdot \left(-\frac{1}{4} \right) + 18 - \frac{5}{13} \cdot 13 = \dots \\
 & 4 \div \left(-\frac{21}{11} \right) \cdot \left(-\frac{1}{4} \right) + 18 - 5 = \dots \rightarrow 4 \cdot \left(\frac{11}{21} \right) \cdot \left(\frac{1}{4} \right) + 13 = \dots \rightarrow \frac{11}{21} + 13 = \dots \\
 & \frac{11}{21} + \frac{273}{21} = \dots \rightarrow \frac{284}{21} ; 13,53
 \end{aligned}$$