3. Rationale Zahlen

3.1. Kürzen, erweitern, gleichnamig machen

1. **Kürze**
   a) $\frac{20}{45} =$
   b) $\frac{28}{60} =$
   c) $\frac{24}{270} =$
   d) $\frac{54}{360} =$
   e) $\frac{91}{117} =$
   f) $-\frac{92}{161} =$
   g) $\frac{35}{420} =$
   h) $\frac{38}{95} =$

2. **Erweitere auf den Nenner 360**
   a) $\frac{11}{72} =$
   b) $\frac{5}{9} =$
   c) $\frac{7}{45} =$

3. **Welche Brüche haben den gleichen Wert?**
   a) $\frac{16}{24}, \frac{15}{20}, \frac{22}{33}, \frac{15}{18}, \frac{10}{15}$
   b) $\frac{2}{5}, \frac{9}{36}, \frac{1}{4}, \frac{8}{20}, \frac{6}{24}$

4. **Ordne die Brüche der Grösse nach.**
   a) $\frac{11}{16}, \frac{5}{8}, \frac{17}{24}, \frac{2}{3}, \frac{7}{12}$
   b) $\frac{21}{24}, \frac{13}{12}, \frac{5}{6}, \frac{5}{4}, 1, \frac{7}{8}$
   c) $\frac{7}{9}, \frac{2}{3}, \frac{3}{4}, \frac{5}{8}, \frac{17}{24}$

5. **Welcher der beiden Brüche ist grösser**
   a) $\frac{4}{5}$ oder $\frac{19}{25}$
   b) $\frac{3}{7}$ oder $-\frac{5}{8}$
   c) $-\frac{1}{15}$ oder $-\frac{1}{17}$

6. **Für welche Werte x gilt die Behauptung?**
   a) $\frac{x}{5} > \frac{7}{12}$
   b) $\frac{x}{3} < -\frac{2}{5}$
   c) $\frac{2}{7} < \frac{x}{12} < \frac{35}{21}$

3.2. Addition und Subtraktion

1. **Berechne die Summen und Differenzen**
   a) $\frac{3}{14} + \frac{7}{8} =$
   b) $\frac{2}{5} + \frac{7}{15} =$
   c) $\frac{2}{3} + \frac{5}{6} + \frac{5}{12} =$
   d) $\frac{5}{8} - \frac{1}{3} =$
   e) $\frac{7}{30} - \frac{5}{36} =$
   f) $\frac{2}{5} + \frac{3}{4} - \frac{7}{2} =$
   g) $\frac{8}{9} - \frac{1}{4} - \frac{1}{6} =$
   h) $\frac{7}{2} + \frac{11}{3} - \frac{13}{4} =$
   i) $\frac{2}{3} - \frac{1}{6} + \frac{5}{12} =$

2. **Jetzt kommen negative Zahlen dazu.**
   a) $\left(-\frac{1}{3}\right) + \left(-\frac{5}{4}\right) - \frac{1}{6} =$
   b) $-\frac{1}{2} - \left(-\frac{1}{4}\right) - \left(-\frac{5}{12}\right) =$

3. **Klammern**

a) $\frac{1}{3} - \left(\frac{1}{4} + \frac{1}{6}\right) =$

b) $\frac{2}{3} - \left(\frac{7}{5} + \frac{3}{2}\right) =$

c) $\frac{5}{8} - \left(\frac{1}{3} - \left(-\frac{5}{6}\right)\right) =$

d) $5 - \left[\frac{2}{5} - \left(\frac{5}{2} - \frac{7}{10}\right) + \frac{17}{2}\right] - \frac{1}{5} =$

3.3. Multiplikation

1. **Berechne**

a) $\frac{8}{5} \cdot \frac{3}{2} =$

b) $5 \cdot \frac{11}{45} =$

c) $\frac{8}{5} \cdot 4 =$

d) $\left(-\frac{8}{3}\right) \cdot \left(-\frac{1}{6}\right) =$

e) $\frac{5}{8} \cdot \frac{16}{5} \cdot \frac{7}{2} =$

f) $\frac{3}{8} \cdot \frac{5}{2} \cdot \frac{14}{35} \cdot 7 =$

g) $\frac{3}{7} \cdot \left(-\frac{21}{2}\right) \cdot \left(-\frac{5}{9}\right) =$

h) $\frac{8}{5} \cdot \frac{1}{2} \cdot \left(-\frac{5}{4}\right) =$

i) $\frac{5}{3} \cdot \frac{2}{15} \cdot \frac{7}{8} \cdot \frac{27}{28} =$

2. **Summen, Produkte und Klammern**

a) $\frac{2}{3} \cdot \left(\frac{1}{4} - \frac{5}{6}\right) =$

b) $\left(\frac{2}{3} + \frac{1}{4}\right) \cdot \left(-\frac{5}{6}\right) =$

c) $\frac{8}{5} \cdot \left(-\frac{5}{7}\right) + 1 =$

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

e) $\left(\frac{1}{4} + \frac{2}{7}\right) \cdot \left(\frac{1}{3} + \frac{1}{5}\right) =$

f) $\frac{3}{5} - \left(\frac{2}{3} - \frac{5}{6}\right) \cdot \left(\frac{1}{2} + \frac{3}{4}\right) =$

3. **Potenzen**

a) $\frac{3}{4} - \left(\frac{2}{3}\right)^2 =$

b) $\left(\frac{3}{4} - \frac{2}{3}\right)^2 =$

c) $\frac{3}{4} \cdot \left(-\frac{2}{3}\right)^2 =$

d) $\frac{1}{3} \cdot \left(\frac{1}{4} - \frac{1}{6}\right)^2 =$

e) $1 - \left(-\frac{2}{5}\right)^2 \cdot 10 =$

f) $\frac{6}{7} \cdot \left(\frac{1}{2} - \frac{5}{3}\right)^2 =$

4. **Thema mit Variationen**

a) $\frac{2}{3} \cdot \frac{1}{4} - \frac{5}{6} \cdot \frac{2}{5} - 2 + \frac{1}{3} \cdot \left(\frac{1}{2}\right)^2 =$

b) $\frac{2}{3} \cdot \frac{1}{4} - \frac{5}{6} \cdot \left(\frac{2}{5} - 2\right) + \left(\frac{1}{3} \cdot \frac{1}{2}\right)^2 =$

c) $\frac{2}{3} \cdot \left[\frac{1}{4} - \frac{5}{6} \cdot \left(\frac{2}{5} - 2\right) + \frac{1}{3}\right] \cdot \left(\frac{1}{2}\right)^2 =$

3.4. Division

1. **Divisionen**
   a) $\frac{7}{8} : 21 =$
   b) $\frac{4}{5} : \frac{5}{4} =$
   c) $\left(-\frac{3}{16}\right) : \frac{9}{32} =$
   d) $\left(-\frac{1}{2}\right) : \left(-\frac{1}{4}\right) =$

2. **Berechne**
   a) $\frac{2}{3} : \frac{1}{4} - \frac{5}{6} =$
   b) $\frac{2}{3} : \left(\frac{1}{4} - \frac{5}{6}\right) =$
   c) $\left(\frac{3}{4} : \frac{2}{3}\right)^2 =$
   d) $\frac{8}{5} \cdot \frac{1}{2} : \left(-\frac{5}{4}\right) =$
   e) $\frac{2}{5} : \left(-\frac{5}{7}\right) + 1 =$
   f) $\frac{3}{4} : \left(-\frac{2}{3}\right)^2 =$

3. **Doppelbrüche**
   a) $\frac{\frac{2}{5}}{3} =$
   b) $\frac{2}{\frac{5}{3}} =$
   c) $\frac{\frac{2}{5}}{\frac{3}{4}} =$

4. **Kombinationen**
   a) $\frac{\frac{1}{2} + \frac{1}{3}}{\frac{7}{6} - 2} =$
   b) $\frac{\frac{7}{12}}{\left(\frac{1}{2} - \frac{5}{3}\right)^2} =$

5. **Königsaufgaben**

a) $\frac{1}{3} + \left(\frac{2}{5} + \frac{1}{10}\right)^2 - \left(\left(\frac{3}{4} - \frac{1}{3}\right) : \left(\frac{1}{5} - \frac{1}{4}\right)\right) \cdot 3 =$

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

c) $\dfrac{\frac{1}{4} - \frac{5}{6} \cdot \left(\frac{2}{5} - 2\right) + \frac{1}{3}}{\frac{1}{4} - \frac{5}{6} \cdot \frac{2}{5} - 2 + \frac{1}{3}} =$