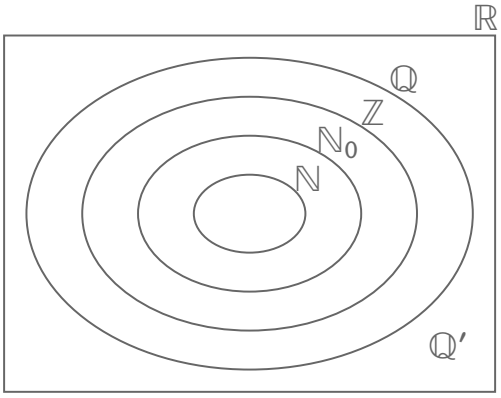
Common fractions

Calculation techniques

Examples

1. Simplify $\frac{24}{42}$ by using the HCF (Highest Common Factor) of the numerator and denominator.
   $F_{24} = \{1; 2; 3; 4; \underline{6}; 8; 12; 24\}$; $F_{42} = \{1; 2; 3; \underline{6}; 7; 14; 21; 42\}$; $\frac{24}{42} = \frac{24 \div 6}{42 \div 6} = \frac{4}{7}$
2. Calculate $\frac{5}{6} + \frac{7}{8}$ by using the LCM (Lowest Common Multiple) of the two denominators.
   $M_6 = \{6; 12; 18; \underline{24}; \ldots\}$; $M_8 = \{8; 16; \underline{24}; \ldots\}$; $\frac{5}{6} + \frac{7}{8} = \frac{5 \times 4}{6 \times 4} + \frac{7 \times 3}{8 \times 3} = \frac{20}{24} + \frac{21}{24} = \frac{41}{24}$
   $= \frac{24}{24} + \frac{17}{24} = 1\frac{17}{24}$
3. Calculate $1\frac{3}{4} \div \frac{4}{5}$ by using the reciprocal relationship: $1\frac{3}{4} \div \frac{4}{5} = \frac{7}{4} \div \frac{4}{5} = \frac{\frac{7}{4}}{\frac{4}{5}} = \frac{\frac{7}{4} \times \frac{5}{4}}{\frac{4}{5} \times \frac{5}{4}} = \frac{\frac{7}{4} \times \frac{5}{4}}{1}$
   $= \frac{7}{4} \times \frac{5}{4} = \frac{35}{16} = 2\frac{3}{16}$

1. Explain the meaning of the drawing alongside.



2. Place the following numbers inside the drawing above.

$\sqrt{16}$; –16; π; $\sqrt[3]{16}$; 16; $\frac{16}{27}$; $\sqrt{27}$; 27; 0; –27; $\sqrt[3]{-27}$; $-1\frac{11}{16}$

3. Simplify the following.

a) $\frac{81}{108}$

b) $-\frac{162}{99}$

c) $\sqrt{\frac{60}{135}}$

d) $\sqrt[3]{-\frac{192}{81}}$

e) $\sqrt{\frac{48a^4}{108a^2}}$

f) $\sqrt[3]{\frac{-54m^8}{16m^2}}$

4. Calculate the following.

a) $15\frac{3}{4} + 2\frac{2}{5}$

b) $15\frac{3}{4} - 2\frac{2}{5}$

c) $15\frac{3}{4} \times 2\frac{2}{5}$

d) $15\frac{3}{4} \div 2\frac{2}{5}$

e) $\left(1\frac{8}{13}\right)^2$

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

g) $\sqrt{1\frac{7}{9}} + \frac{2}{3}$

h) $\sqrt[3]{-5\frac{23}{64}} - \frac{1}{4}$

i) $\left(\frac{3x^3}{y^3}\right)^2 + \left(\frac{2x^2}{y^2}\right)^3$

j) $\sqrt[3]{\frac{125a^6}{216b^3}} + \sqrt{\frac{169a^4}{36b^2}}$

Common fractions

Solving problems; Equivalent forms

Examples

1. Convert $\frac{7}{8}$ to a decimal fraction and a percentage without using a calculator.
   $\frac{7}{8} = \frac{7 \times 125}{8 \times 125} = \frac{875}{1\,000} = 0{,}875$; $\frac{7}{8} = \frac{7 \times 125}{8 \times 125} = \frac{875}{1\,000} = \frac{875 \div 10}{1\,000 \div 10} = \frac{87{,}5}{100} = 87{,}5\%$
2. Convert 0,365 to a common fraction and a percentage without using a calculator.
   $0{,}365 = \frac{365}{1\,000} = \frac{365 \div 5}{1\,000 \div 5} = \frac{73}{200}$; $0{,}365 = \frac{365}{1\,000} = \frac{365 \div 10}{1\,000 \div 10} = \frac{36{,}5}{100} = 36{,}5\%$
3. Convert 76,25% to a common fraction and a decimal fraction without using a calculator.
   $76{,}25\% = \frac{76{,}25}{100} = \frac{76{,}25 \times 100}{100 \times 100} = \frac{7\,625}{10\,000} = \frac{7\,625 \div 125}{10\,000 \div 125} = \frac{61}{80}$; $76{,}25\% = \frac{76{,}25}{100} = 0{,}762\,5$

1. Determine the value of *.

a) $\frac{3}{25} = \frac{*}{75}$ **b)** $\frac{*}{19} = \frac{65}{95}$ **c)** $\frac{13}{17} = \frac{78}{*}$

d) $\frac{21}{*} = \frac{147}{238}$ **e)** $\frac{*}{19} = \frac{95}{361}$ **f)** $\frac{276}{529} = \frac{*}{23}$

2. Convert the following common fractions to a decimal fraction and a percentage.

a) $\frac{9}{20}$

b) $\frac{9}{125}$

c) $\frac{9}{40}$

3. Convert the following decimal fractions to a common fraction and a percentage.

a) 0,65

b) 0,475

c) 0,187 5

4. Convert the following percentages to a common fraction and a decimal fraction.

a) 64%

b) 87,5%

c) 37,84%

5. A bag contains 360 balls of which $\frac{7}{20}$ are blue, 0,325 are green and 20% are red. If $\frac{4}{9}$ of the remaining balls are white, calculate the number of white balls in the bag.

6. Calculate the percentage decrease if the price of petrol changes from R12,50/ℓ to R12,10/ℓ.