

Aufgabe 7

a) $\sqrt{3} \cdot \sqrt{10} = \sqrt{3 \cdot 10} = \sqrt{30}$

b) $5 \cdot \sqrt{2} \cdot \sqrt{7} = 5 \cdot \sqrt{2 \cdot 7} = 5\sqrt{14}$

c) $\sqrt{11} \cdot 3 \cdot \sqrt{3} = 3 \cdot \sqrt{11 \cdot 3} = 3\sqrt{33}$

d) $(\sqrt{13})^2 = \sqrt{13} \cdot \sqrt{13} = \sqrt{13 \cdot 13} = \sqrt{169} = 13$

e) $(3 \cdot \sqrt{2})^2 = 3 \cdot \sqrt{2} \cdot 3 \cdot \sqrt{2} = 9 \cdot \sqrt{2 \cdot 2} = 9 \cdot \sqrt{4} = 9 \cdot 2 = 18$

f)

$$\begin{aligned} (-5 \cdot \sqrt{10})^2 &= -5 \cdot \sqrt{10} \cdot (-5) \cdot \sqrt{10} \\ &= 25 \cdot \sqrt{10 \cdot 10} \\ &= 25 \cdot \sqrt{100} \\ &= 25 \cdot 10 = 250 \end{aligned}$$

g)

$$\begin{aligned} \sqrt{2} \cdot (2 + \sqrt{3}) &= \sqrt{2} \cdot 2 + \sqrt{2} \cdot \sqrt{3} \\ &= 2\sqrt{2} + \sqrt{2 \cdot 3} \\ &= 2\sqrt{2} + \sqrt{6} \end{aligned}$$

h)

$$\begin{aligned} \sqrt{3} \cdot (\sqrt{3} - 5) &= \sqrt{3} \cdot \sqrt{3} - \sqrt{3} \cdot 5 \\ &= \sqrt{3 \cdot 3} - 5\sqrt{3} \\ &= \sqrt{9} - 5\sqrt{3} \\ &= 3 - 5\sqrt{3} \end{aligned}$$

Aufgabe 8

a)

$$\begin{aligned}\sqrt{2} \cdot (\sqrt{3} + 5) &= \sqrt{2} \cdot \sqrt{3} + \sqrt{2} \cdot 5 \\ &= \sqrt{2 \cdot 3} + 5\sqrt{2} \\ &= \sqrt{6} + 5\sqrt{2}\end{aligned}$$

b)

$$\begin{aligned}(\sqrt{14} + \sqrt{11}) \cdot \sqrt{3} &= \sqrt{14} \cdot \sqrt{3} + \sqrt{11} \cdot \sqrt{3} \\ &= \sqrt{14 \cdot 3} + \sqrt{11 \cdot 3} \\ &= \sqrt{42} + \sqrt{33}\end{aligned}$$

c)

$$\begin{aligned}(\sqrt{7} + 6) \cdot (\sqrt{2} - 1) &= \sqrt{7} \cdot \sqrt{2} - \sqrt{7} \cdot 1 + 6 \cdot \sqrt{2} - 6 \cdot 1 \\ &= \sqrt{7 \cdot 2} - \sqrt{7} + 6\sqrt{2} - 6 \\ &= \sqrt{14} - \sqrt{7} + 6\sqrt{2} - 6\end{aligned}$$

d)

$$\begin{aligned}(\sqrt{11} - 3) \cdot (\sqrt{11} + 3) &= \sqrt{11} \cdot \sqrt{11} + \sqrt{11} \cdot 3 - 3 \cdot \sqrt{11} - 3 \cdot 3 \\ &= \sqrt{11 \cdot 11} + 3\sqrt{11} - 3\sqrt{11} - 9 \\ &= \sqrt{121} - 9 \\ &= 11 - 9 \\ &= 2\end{aligned}$$

Aufgabe 9

a) $\sqrt{27} = \sqrt{9 \cdot 3} = \sqrt{9} \cdot \sqrt{3} = 3\sqrt{3}$

b) $\sqrt{200} = \sqrt{4 \cdot 25 \cdot 2} = \sqrt{4} \cdot \sqrt{25} \cdot \sqrt{2} = 2 \cdot 5 \cdot \sqrt{2} = 10\sqrt{2}$

c) $\sqrt{15}$

d) $\sqrt{\frac{32}{125}} = \sqrt{\frac{16 \cdot 2}{25 \cdot 5}} = \sqrt{\frac{16}{25} \cdot \frac{2}{5}} = \frac{\sqrt{16}}{\sqrt{25}} \cdot \sqrt{\frac{2}{5}} = \frac{4}{5} \sqrt{\frac{2}{5}}$

e) $\sqrt{\frac{30}{7}}$ — Tippfehler?

f) $\sqrt{0,02} = \sqrt{\frac{2}{100}} = \frac{\sqrt{2}}{\sqrt{100}} = \frac{\sqrt{2}}{10}$

Aufgabe 10

a) $3 \cdot \sqrt{7} = \sqrt{3^2 \cdot 7} = \sqrt{9 \cdot 7} = \sqrt{63}$

b) $2 \cdot \sqrt{2} = \sqrt{2^2 \cdot 2} = \sqrt{4 \cdot 2} = \sqrt{8}$

c) $6 \cdot \sqrt{\frac{1}{6}} = \sqrt{6^2 \cdot \frac{1}{6}} = \sqrt{36 \cdot \frac{1}{6}} = \sqrt{6}$

d) $0,5 \cdot \sqrt{2} = \sqrt{0,5^2 \cdot 2} = \sqrt{0,25 \cdot 2} = \sqrt{0,5}$

e) $\frac{3}{4} \cdot \sqrt{\frac{8}{15}} = \sqrt{\frac{3^2}{4^2} \cdot \frac{8}{15}} = \sqrt{\frac{9}{16} \cdot \frac{8}{15}} = \sqrt{\frac{3 \cdot 1}{2 \cdot 5}} = \sqrt{\frac{3}{10}}$

f) $0,1 \cdot \sqrt{0,1} = \sqrt{0,1^2 \cdot 0,1} = \sqrt{0,01 \cdot 0,1} = \sqrt{0,001}$