Realschule

4. Mathematikschulaufgabe

Klasse 9

- Lösungen -

1. a) $\sqrt{3}\cdot\sqrt{12}=\sqrt{3\cdot 12}=\sqrt{36}=\underline{\underline{6}}$

b) $2\sqrt{8}\cdot 5\cdot\sqrt{2}=2\cdot 5\cdot\sqrt{2\cdot 8}=10\sqrt{16}=\underline{\underline{40}}$

c) $\frac{\sqrt{50}}{\sqrt{2}}=\sqrt{\frac{50}{2}}=\sqrt{25}=\underline{\underline{5}}$

d) $\sqrt{25x^2}=\underline{\underline{5x}}$

e) $\sqrt{49a^6\cdot b^4}=\underline{\underline{7a^3b^2}}$

f) $\sqrt{8^2+6^2}=\sqrt{100}=\underline{\underline{10}}$

g) $\sqrt{8^2\cdot 6^2}=8\cdot 6=\underline{\underline{48}}$

2. a) $\left(\sqrt{50}+2\sqrt{18}\right)\sqrt{2}=\sqrt{50\cdot 2}+2\sqrt{18\cdot 2}=\sqrt{100}+2\sqrt{36}=10+12=\underline{\underline{22}}$

b) $\left(3-2\sqrt{5}\right)\left(4+3\sqrt{5}\right)=12+9\sqrt{5}-8\sqrt{5}-6\cdot 5=\underline{\underline{\sqrt{5}-18}}$

c) $\left(3\sqrt{5}-\sqrt{3}\right)\left(3\sqrt{5}+\sqrt{3}\right)=\left(3\sqrt{5}\right)^2-\left(\sqrt{3}\right)^2=9\cdot 5-3=\underline{\underline{42}}$

d) $\left(\sqrt{7}-\sqrt{2}\right)^2=\left(\sqrt{7}\right)^2-2\sqrt{7\cdot 2}+\left(\sqrt{2}\right)^2=7-2\sqrt{14}+2=\underline{\underline{9-2\sqrt{14}}}$

3.

$$\begin{array}{rl} \sqrt{2}x+\sqrt{3}y=2\sqrt{5} & \mid\cdot 3 \\ \wedge\ 2\sqrt{2}x-3\sqrt{3}y=\sqrt{5} & \end{array}$$

$$\begin{array}{rl} 3\sqrt{2}x+3\sqrt{3}y=6\sqrt{5} & \\ \wedge\ 2\sqrt{2}x-3\sqrt{3}y=\sqrt{5} & \end{array}$$

Additionsmethode

$$\begin{array}{rl} 5\sqrt{2}\,x=7\sqrt{5} & \mid :\,5\sqrt{2} \\ x=\frac{7\sqrt{5}}{5\sqrt{2}} & \\ \underline{\underline{x=1{,}4\sqrt{2{,}5}=\sqrt{4{,}9}\approx 2{,}21}} & \end{array}$$

$x=1{,}4\sqrt{2{,}5}$ einsetzen:

$$\begin{aligned} \sqrt{2}\,x+\sqrt{3}\,y&=2\sqrt{5} \\ \sqrt{2}\cdot 1{,}4\sqrt{2{,}5}+\sqrt{3}\,y&=2\sqrt{5} \\ \sqrt{3}\,y&=2\sqrt{5}-1{,}4\sqrt{5} \\ y&=\frac{0{,}6\sqrt{5}}{\sqrt{3}} \\ y&=0{,}6\sqrt{\frac{5}{3}} \\ \underline{\underline{y}}&\underline{\underline{=\sqrt{0{,}6}\approx 0{,}77}} \end{aligned}$$