

Teilweises Wurzelziehen / Rationalmachen des Nenners – Lösungen

1. Ziehe teilweise die Wurzel.

a) $\sqrt{32}$ $= 4\sqrt{2}$	b) $\sqrt{75}$ $= 5\sqrt{3}$	c) $\sqrt{20}$ $= 2\sqrt{5}$	d) $\sqrt{8}$ $= 2\sqrt{2}$	e) $\sqrt{162}$ $= 9\sqrt{2}$
f) $\sqrt{192}$ $= 8\sqrt{3}$	g) $\sqrt{125}$ $= 5\sqrt{5}$	h) $\sqrt{45}$ $= 3\sqrt{5}$	i) $\sqrt{80}$ $= 4\sqrt{5}$	k) $\sqrt{243}$ $= 9\sqrt{3}$
l) $\sqrt{40}$ $= 2\sqrt{10}$	m) $\sqrt{54}$ $= 3\sqrt{6}$	n) $\sqrt{42}$ $= 2\sqrt{10,5}$	o) 72 $= 6\sqrt{2}$	p) $\sqrt{288}$ $= 12\sqrt{2}$

2. Ziehe teilweise die Wurzel.

a) $\sqrt{4a}$ $= 2\sqrt{a}$	b) $\sqrt{25a^2b}$ $= 5a\sqrt{b}$	c) $\sqrt{49xy^2}$ $= 7y\sqrt{x}$	d) $\sqrt{81x^3}$ $= 9x\sqrt{x}$	e) $\sqrt{16m^2n}$ $= 4m\sqrt{n}$
f) $\sqrt{8a}$ $= 2\sqrt{2a}$	g) $\sqrt{48x^4y^3}$ $= 4x^2y\sqrt{3y}$	h) $\sqrt{98a^5b^3}$ $= 7a^2b\sqrt{2ab}$	i) $\sqrt{24a^2b^5}$ $= 2ab^2\sqrt{6b}$	k) $\sqrt{54xy^3}$ $= 3y\sqrt{6xy}$

3. Ziehe teilweise die Wurzel.

a) $\sqrt{9a+9b}$ $= 3\sqrt{a+b}$	b) $\sqrt{4x-4y}$ $= 2\sqrt{x-y}$	c) $\sqrt{9m-27n}$ $= 3\sqrt{m-3n}$	d) $\frac{\sqrt{36p+108q}}{\sqrt{54xy^3}}$ $= \frac{6\sqrt{p+3q}}{\sqrt{54xy^3}}$	e) $\sqrt{16m^2n}$ $= 4m\sqrt{n}$
e) $\frac{\sqrt{9x^2y^3-18x^2}}{\sqrt{8ab^2+12ab^3}}$ $= \frac{3x\sqrt{y^3-2}}{2b\sqrt{2a+3ab}}$	f) $\frac{\sqrt{8ab^2+12ab^3}}{\sqrt{12u^3v^3-8u^2v^2}}$ $= \frac{2b\sqrt{2a+3ab}}{2uv\sqrt{3uv-2}}$	g) $\frac{\sqrt{12u^3v^3-8u^2v^2}}{\sqrt{50a^2+75a^2b}}$ $= \frac{2uv\sqrt{3uv-2}}{5a\sqrt{2+3b}}$	h) $\frac{\sqrt{50a^2+75a^2b}}{\sqrt{54xy^3}}$ $= \frac{5a\sqrt{2+3b}}{\sqrt{54xy^3}}$	

4. Mache den Nenner rational.

a) $\frac{1}{\sqrt{5}}$ $= \frac{\sqrt{5}}{1} = \sqrt{5}$	b) $\frac{5}{\sqrt{7}}$ $= \frac{5\sqrt{7}}{7}$	c) $\frac{2}{\sqrt{26}}$ $= \frac{2\sqrt{26}}{26} = \frac{\sqrt{26}}{13}$	d) $\frac{5}{\sqrt{11}}$ $= \frac{5\sqrt{11}}{11}$	e) $\frac{7}{\sqrt{65}}$ $= \frac{7\sqrt{65}}{65}$
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5. Schreibe als Quotient zweier Wurzeln und mache den Nenner rational.

$$\begin{array}{lllll}
 \text{a) } \sqrt{\frac{3}{5}} & \text{b) } \sqrt{\frac{7}{8}} & \text{c) } \sqrt{\frac{3}{13}} & \text{d) } \sqrt{\frac{8}{11}} & \text{e) } \sqrt{\frac{5}{17}} \\
 = \frac{\sqrt{3}}{\sqrt{5}} = \frac{\sqrt{15}}{5} & = \frac{\sqrt{7}}{\sqrt{8}} = \frac{\sqrt{56}}{8} & = \frac{\sqrt{3}}{\sqrt{13}} = \frac{\sqrt{39}}{13} & = \frac{\sqrt{8}}{\sqrt{11}} = \frac{\sqrt{88}}{11} & = \frac{\sqrt{5}}{\sqrt{17}} = \frac{\sqrt{85}}{17}
 \end{array}$$

6. Mache den Nenner rational.

$$\begin{array}{lllll}
 \text{a) } \frac{\sqrt{2} + \sqrt{3}}{\sqrt{3}} & \text{b) } \frac{\sqrt{7} - \sqrt{12}}{\sqrt{7}} & \text{c) } \frac{\sqrt{5} - \sqrt{2}}{\sqrt{5}} & \text{d) } \frac{\sqrt{6} + 2\sqrt{3}}{2\sqrt{3}} & \text{e) } \frac{\sqrt{13} - 2\sqrt{7}}{2\sqrt{7}} \\
 = \frac{\sqrt{6} + 3}{3} & = \frac{7 - \sqrt{84}}{7} & = \frac{5 - \sqrt{10}}{5} & = \frac{2\sqrt{12} + 12}{12} & = \frac{2\sqrt{91} - 28}{28}
 \end{array}$$

7. Mache den Nenner rational.

$$\begin{array}{lllll}
 \text{a) } \frac{\sqrt{5}}{\sqrt{3} - 2} & \text{b) } \frac{\sqrt{8}}{\sqrt{5} - \sqrt{3}} & \text{c) } \frac{6\sqrt{7}}{\sqrt{12} + 3\sqrt{5}} & \text{d) } \frac{\sqrt{7} + \sqrt{5}}{\sqrt{7} - \sqrt{5}} & \text{e) } \frac{\sqrt{13} - 2\sqrt{7}}{2\sqrt{7}} \\
 = \frac{\sqrt{5}(\sqrt{3} + 2)}{-1} & = \frac{\sqrt{8}(\sqrt{5} + \sqrt{3})}{2} & = \frac{6\sqrt{7}(\sqrt{12} - 3\sqrt{5})}{12 - 45} & = \frac{(\sqrt{7} + \sqrt{5})^2}{2} & \\
 = -\sqrt{15} - 2\sqrt{5} & = \frac{\sqrt{40} + \sqrt{24}}{2} & = \frac{6\sqrt{84} - 18\sqrt{35}}{-33} & = \frac{12 + 2\sqrt{35}}{2} = 6 + \sqrt{35} &
 \end{array}$$