

6BG	Klasse 10	Potenzfunktionen	Mathematik
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Fehlersuche: Potenzen mit rationalen Exponenten

Welche Terme passen nicht zum ersten Term in der Reihe?

$$1. \quad 3^{\frac{1}{2}} = \sqrt{3} = 3^2 = \sqrt{3^2} = \sqrt{\sqrt{9}}$$

$$2. \quad 4^{\frac{3}{5}} = (2^2)^{\frac{6}{10}} = \sqrt[5]{4^3} = \sqrt[3]{2^{10}} = \sqrt[10]{4^6}$$

$$3. \quad \sqrt[6]{8^2} = \sqrt[6]{4^4} = 8^{\frac{1}{3}} = 4^{\frac{2}{3}} = \sqrt[15]{4^{10}}$$

$$4. \quad 5^{-\frac{1}{2}} = -5^{\frac{1}{2}} = \frac{1}{\sqrt{5}} = -\sqrt{5} = 25^{-\frac{1}{4}}$$

$$5. \quad 9^{\frac{4}{3}} = \sqrt[3]{3^8} = \sqrt[3]{9^4} = \sqrt[3]{\frac{9^6}{81}} = 3^{\frac{8}{6}}$$

$$6. \quad \left(5^{\frac{4}{5}}\right)^{\frac{5}{2}} = \left(\sqrt[5]{5^4}\right)^{\frac{5}{2}} = 5^2 = \sqrt{25} = 5^{\frac{6}{3}}$$

$$7. \quad \left(49^{-\frac{6}{5}}\right)^{\frac{5}{12}} = 49^{-\frac{11}{17}} = \frac{1}{7} = \frac{1}{-49^{\frac{1}{2}}} = 49^{-\frac{1}{2}}$$

$$8. \quad \sqrt{3} \cdot \sqrt{3^3} = \frac{1}{3^{-2}} = 3^{\frac{1}{2}} \cdot 3^{\frac{3}{2}} = 9 = \sqrt{3^4}$$

$$9. \quad 6^{\frac{1}{2}} : 6^{-\frac{9}{6}} = 36 = \frac{6^{\frac{1}{2}}}{6^{-\frac{9}{6}}} = \sqrt[6]{6^{12}} = 6^{\frac{1}{2}} : 6^{\frac{9}{6}}$$

$$10. \quad \frac{\sqrt[3]{8}}{\sqrt[4]{81}} = 8^{\frac{1}{3}} \cdot 3^{-1} = 8^{\frac{4}{12}} : 3^{\frac{3}{12}} = \frac{2}{3} = \sqrt[12]{\frac{8}{3}}$$

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Fehlersuche: Potenzen mit rationalen Exponenten – Lösung

Welche Terme passen nicht zum ersten Term in der Reihe?

1.	$3^{\frac{1}{2}}$	$= \sqrt{3}$	$= 3^2$	$= \sqrt{3^2}$	$= \sqrt{\sqrt{9}}$
2.	$4^{\frac{3}{5}}$	$= (2^2)^{\frac{6}{10}}$	$= \sqrt[5]{4^3}$	$= \sqrt[3]{2^{10}}$	$= \sqrt[10]{4^6}$
3.	$\sqrt[6]{8^2}$	$= \sqrt[6]{4^4}$	$= 8^{\frac{1}{3}}$	$= 4^{\frac{2}{3}}$	$= \sqrt[15]{4^{10}}$
4.	$5^{-\frac{1}{2}}$	$= -5^{\frac{1}{2}}$	$= \frac{1}{\sqrt{5}}$	$= -\sqrt{5}$	$= 25^{-\frac{1}{4}}$
5.	$9^{\frac{4}{3}}$	$= \sqrt[3]{3^8}$	$= \sqrt[3]{9^4}$	$= \sqrt[3]{\frac{9^6}{81}}$	$= 3^{\frac{8}{6}}$
6.	$\left(5^{\frac{4}{5}}\right)^{\frac{5}{2}}$	$= \left(\sqrt[5]{5^4}\right)^{\frac{5}{2}}$	$= 5^2$	$= \sqrt{25}$	$= 5^{\frac{6}{3}}$
7.	$\left(49^{-\frac{6}{5}}\right)^{\frac{5}{12}}$	$= 49^{-\frac{11}{17}}$	$= \frac{1}{7}$	$= \frac{1}{-49^{\frac{1}{2}}}$	$= 49^{-\frac{1}{2}}$
8.	$\sqrt{3} \cdot \sqrt{3^3}$	$= \frac{1}{3^{-2}}$	$= 3^{\frac{1}{2}} \cdot 3^{\frac{3}{2}}$	$= 9$	$= \sqrt{3^4}$
9.	$6^{\frac{1}{2}} : 6^{-\frac{9}{6}}$	$= 36$	$= \frac{6^{\frac{1}{2}}}{6^{-\frac{9}{6}}}$	$= \sqrt[6]{6^{12}}$	$= 6^{\frac{1}{2}} : 6^{\frac{9}{6}}$
10.	$\frac{\sqrt[3]{8}}{\sqrt[4]{81}}$	$= 8^{\frac{1}{3}} \cdot 3^{-1}$	$= 8^{\frac{4}{12}} : 3^{\frac{3}{12}}$	$= \frac{2}{3}$	$= \sqrt[12]{\frac{8}{3}}$