2156 Bestäm exponenten x

a) $\sqrt{\frac{a}{b}\sqrt{\frac{a}{b}}} = \left(\frac{a}{b}\right)^x$

$\Leftrightarrow \left(\frac{a}{b}\cdot\sqrt{\frac{a}{b}}\right)^{1/2} = \left(\frac{a}{b}\right)^x$

$\Leftrightarrow \left(\frac{a}{b}\cdot\left(\frac{a}{b}\right)^{1/2}\right)^{1/2} = \left(\frac{a}{b}\right)^x$

$\Leftrightarrow \frac{a^{1/2}}{b^{1/2}}\cdot\frac{a^{1/4}}{b^{1/4}} = \left(\frac{a}{b}\right)^x$

$\Leftrightarrow \frac{a^{1/2+1/4}}{b^{1/2+1/4}} = \left(\frac{a}{b}\right)^x$

$\Leftrightarrow \frac{a^{2/4+1/4}}{b^{2/4+1/4}} = \left(\frac{a}{b}\right)^x$

$\Leftrightarrow \frac{a^{3/4}}{b^{3/4}} = \left(\frac{a}{b}\right)^x$

$\Leftrightarrow \left(\frac{a}{b}\right)^{3/4} = \left(\frac{a}{b}\right)^x$

Svar: $x = \frac{3}{4}$

2156 Bestäm talet x

b) $$\sqrt{\frac{a}{b}\cdot\sqrt{\frac{b}{a}\cdot\sqrt{\frac{a}{b}}}} = \left(\frac{a}{b}\right)^x$$

$$\Leftrightarrow \left(\frac{a}{b}\left(\frac{b}{a}\left(\frac{a}{b}\right)^{1/2}\right)^{1/2}\right)^{1/2} = \left(\frac{a}{b}\right)^x$$

$$\Leftrightarrow \frac{a^{1/2}}{b^{1/2}}\cdot\frac{b^{1/4}}{a^{1/4}}\cdot\frac{a^{1/8}}{b^{1/8}} = \left(\frac{a}{b}\right)^x$$

$$\Leftrightarrow \frac{a^{\frac{1}{2}+\frac{1}{8}-\frac{1}{4}}}{b^{\frac{1}{2}+\frac{1}{8}-\frac{1}{4}}} = \left(\frac{a}{b}\right)^x$$

$$\Leftrightarrow \frac{a^{\frac{4}{8}+\frac{1}{8}-\frac{2}{8}}}{b^{\frac{4}{8}+\frac{1}{8}-\frac{2}{8}}} = \left(\frac{a}{b}\right)^x$$

$$\Leftrightarrow \frac{a^{3/8}}{b^{3/8}} = \left(\frac{a}{b}\right)^x$$

$$\Leftrightarrow \left(\frac{a}{b}\right)^{3/8} = \left(\frac{a}{b}\right)^x$$

Svar: $x = 3/8$