

$$\sqrt{x} = (x)^{\frac{1}{2}}$$

1173

(a) Skriv om VL med hjälp av potenslagar:

$$a \cdot a^{\frac{1}{2}} = a^1 \cdot a^{\frac{1}{2}} = a^{1+\frac{1}{2}}$$

$$\begin{aligned} \sqrt{\frac{a}{b}} \sqrt{\frac{a}{b}} &= \left(\frac{a}{b} \left(\frac{a}{b} \right)^{\frac{1}{2}} \right)^{\frac{1}{2}} = \left(\frac{a}{b} \cdot \frac{a^{\frac{1}{2}}}{b^{\frac{1}{2}}} \right)^{\frac{1}{2}} = \left(\frac{a^{\frac{3}{2}}}{b^{\frac{3}{2}}} \right)^{\frac{1}{2}} \\ &= \frac{a^{\frac{3}{2} \cdot \frac{1}{2}}}{b^{\frac{3}{2} \cdot \frac{1}{2}}} = \frac{a^{\frac{3}{4}}}{b^{\frac{3}{4}}} = \left(\frac{a}{b} \right)^{\frac{3}{4}} \end{aligned}$$

Alltså måste $x = \frac{3}{4}$ (Svar)

(b) Skriv om VL:

$$\sqrt{\frac{a}{b}} \sqrt{\frac{b}{a}} \sqrt{\frac{a}{b}} = \left[\frac{a}{b} \left(\frac{b}{a} \left(\frac{a}{b} \right)^{\frac{1}{2}} \right)^{\frac{1}{2}} \right]^{\frac{1}{2}} = \left[\frac{a}{b} \left(\frac{b}{a} \cdot \frac{a^{\frac{1}{2}}}{b^{\frac{1}{2}}} \right)^{\frac{1}{2}} \right]^{\frac{1}{2}}$$

$$\begin{aligned} \frac{a^{\frac{1}{2}}}{a} &= \frac{a^{\frac{1}{2}}}{a^1} = a^{\frac{1}{2}-1} = a^{-\frac{1}{2}} = \frac{1}{a^{\frac{1}{2}}} \\ \text{alt. } \frac{a^{\frac{1}{2}}}{a} &= \frac{a^{\frac{1}{2}}}{a^{\frac{1}{2} \cdot a^{\frac{1}{2}}}} = \frac{1}{a^{\frac{1}{2}}} \end{aligned}$$

$$\begin{aligned} &= \left[\frac{a}{b} \left(\frac{b^{\frac{1}{2}}}{a^{\frac{1}{2}}} \right)^{\frac{1}{2}} \right]^{\frac{1}{2}} = \left[\frac{a}{b} \frac{b^{\frac{1}{4}}}{a^{\frac{1}{4}}} \right]^{\frac{1}{2}} \\ &= \left[\frac{a^{\frac{3}{4}}}{b^{\frac{3}{4}}} \right]^{\frac{1}{2}} = \frac{a^{\frac{3}{8}}}{b^{\frac{3}{8}}} = \left(\frac{a}{b} \right)^{\frac{3}{8}} \end{aligned}$$

Alltså måste $x = \frac{3}{8}$ (Svar)