

# Die Wurzel von 2 mit Hilfe eines Kettenbruches näherungsweise berechnen

$$(\sqrt{2} \approx 1,41421356\dots)$$

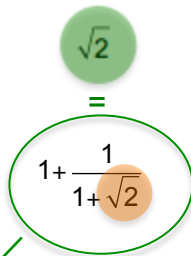
$$\sqrt{2} = 1 + \sqrt{2} - 1 = 1 + \frac{1}{\sqrt{2} - 1} = 1 + \frac{1}{\frac{1}{(\sqrt{2} + 1)(\sqrt{2} - 1)}} = 1 + \frac{1}{2 - 1}$$

$$= 1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{1 + \sqrt{2}}}}}} = 1 + \frac{1}{2 + \frac{1}{2 + \frac{1}{2 + \frac{1}{2 + \frac{1}{2 + \frac{1}{1 + \sqrt{2}}}}}}}$$

$$\approx 1 + \frac{1}{2 + \frac{1}{2 + \frac{1}{2 + \frac{1}{2 + \frac{1}{2 + \frac{1}{2}}}}} = 1 + \frac{1}{2 + \frac{1}{2 + \frac{1}{2 + \frac{1}{2 + \frac{1}{2 + \frac{1}{2 + \frac{1}{5}}}}}}} = 1 + \frac{1}{2 + \frac{1}{2 + \frac{1}{2 + \frac{1}{2 + \frac{1}{2 + \frac{1}{2 + \frac{1}{12}}}}}}}$$

$$= 1 + \frac{1}{2 + \frac{1}{2 + \frac{1}{2 + \frac{1}{2 + \frac{1}{2 + \frac{1}{2 + \frac{1}{12}}}}}}} = 1 + \frac{1}{2 + \frac{1}{2 + \frac{1}{2 + \frac{1}{2 + \frac{1}{2 + \frac{1}{2 + \frac{1}{29}}}}}}} = 1 + \frac{1}{2 + \frac{1}{2 + \frac{1}{2 + \frac{1}{2 + \frac{1}{2 + \frac{1}{2 + \frac{1}{70}}}}}}}$$

$$= 1 + \frac{1}{2 + \frac{1}{2 + \frac{1}{29}}} = 1 + \frac{1}{2 + \frac{1}{169}} = 1 + \frac{1}{2 + \frac{70}{169}} = 1 + \frac{1}{\frac{408}{169}} = 1 + \frac{169}{408} \approx \underline{1,414216}$$



fortlaufendes Einsetzen des umrahmten Ausdrucks für  $\sqrt{2}$