

$$20 \cdot \log_{10}(M) \stackrel{?}{=} M$$

Solution for M

$$20 \cdot \frac{\ln(M)}{\ln(10)} = M$$

$$\ln(M) = M \cdot \frac{\ln(10)}{20} \quad | e$$

$$M = e^{M \cdot \frac{\ln(10)}{20}} \quad | \frac{1}{x}$$

$$\frac{1}{M} = e^{-M \cdot \frac{\ln(10)}{20}}$$

$$1 = M \cdot e^{-M \cdot \frac{\ln(10)}{20}}$$

$$1 = -X \cdot \frac{20}{\ln(10)} \cdot e^{+X}$$

$$X \cdot e^X = \underbrace{Y = -\frac{\ln(10)}{20}}$$

$$\left. \begin{array}{l} \text{Subst. } X := -M \cdot \frac{\ln(10)}{20} \\ \Rightarrow M = -X \cdot \frac{20}{\ln(10)} \end{array} \right\}$$

$$\Rightarrow M = -X \cdot \frac{20}{\ln(10)}$$

$$\left\{ \text{extract } x \cdot e^x := y \right.$$

$$\left. \begin{array}{l} \text{Lambert Function} \\ x = W(y) \end{array} \right\}$$

$$M = -W(Y) \cdot \frac{20}{\ln(10)}$$

$$M = -\frac{20}{\ln(10)} \cdot W\left(-\frac{\ln(10)}{20}\right) \approx 1,14028753461$$