Logarithm Worksheet

Solve each of the following equations for $x$ using the 3 logarithm identities and the 3 logarithm rules. Be sure to show your work.

Logarithm Identities

\[
\begin{align*}
\log_{10}(10) &= 1, \\
\log_{10}(10^x) &= x, \\
10^\log_{10}(x) &= x.
\end{align*}
\]

Logarithm Rules

\[
\begin{align*}
\log_{10}(a \times b) &= \log_{10}(a) + \log_{10}(b), \\
\log_{10}\left(\frac{a}{b}\right) &= \log_{10}(a) - \log_{10}(b), \\
10^\log_{10}(a^n) &= n \times \log_{10}(a).
\end{align*}
\]

1. $2^x = 16.$

2. $\log_{10}(x) = 2.$

3. $3^x = 10.$
4. \(\log_{10}(x) = 1.\)

5. \(16^x = 2.\)

6. \(\log_{10}(x) = 0.301.\)

7. \(2^x = 1.08.\)

8. \(\log_{10}(x) = 25.\)

9. \((1 + x)^0 = 2.\)

10. \((1 + x)^{15} = 2.\)