

Quiz 2

1. Write the exponential equation $e^{x^2} = 4$ in the equivalent logarithmic form.

$$e^{x^2} = 4 \iff x^2 = \ln 4$$

2. Write the logarithmic equation $\log_5 2 = x$ in the equivalent exponential form.

$$\log_5 2 = x \iff 2 = 5^x$$

3. Solve the equation $2^x = e^{x+2}$.

$$\begin{aligned} 2^x = e^{x+2} &\iff \ln(2^x) = \ln(e^{x+2}) \\ &\iff x \ln 2 = x + 2 \\ &\iff x \ln 2 - x = 2 \\ &\iff x(\ln 2 - 1) = 2 \\ &\iff x = \frac{2}{\ln 2 - 1} \end{aligned}$$

4. Solve the equation $\ln(2x) = 2 \ln\left(\frac{4}{3}\right)$

$$\begin{aligned} \ln(2x) = 2 \ln\left(\frac{4}{3}\right) &\iff \ln(2x) = \ln\left(\frac{4}{3}\right)^2 \\ &\iff \ln(2x) = \ln\left(\frac{16}{9}\right) \\ &\iff 2x = \frac{16}{9} \\ &\iff x = \frac{8}{9} \end{aligned}$$