

section 6.3

6.3 [1

2) $f(x) = \log_b x$ and $g(x) = b^x$ are inverse functions.

$$(f \circ g)(x) = f(g(x)) = f(b^x) = \log_b (b^x) = x$$

$$(g \circ f)(x) = g(f(x)) = g(\log_b x) = b^{(\log_b x)} = x$$

4) Common logarithm is logarithm of base 10 and it is written without base number $\{\log(\cdot)\}$.

$$\log_b N = p \Leftrightarrow N = b^p$$

$$\ln N = p \Leftrightarrow N = e^p$$

$$\log N = p \Leftrightarrow N = 10^p$$

$$6) \log_4 (q) = m \Rightarrow q = 4^m$$

$$8) \log_{16} (y) = x \Rightarrow y = 16^x$$

$$10) \log_y x = -11 \Rightarrow x = y^{-11} = \frac{1}{y^{11}}$$

$$12) \log_y (137) = x \Rightarrow 137 = y^x$$

$$14) \log (v) = t \Rightarrow v = 10^t$$

$$16) 4^x = y \Rightarrow x = \log_4(y)$$

$$18) m^{-7} = n \Rightarrow -7 = \log_m(n)$$

$$20) x^{-\frac{10}{13}} = y \Rightarrow \frac{-10}{13} = \log_x(y)$$

$$22) \left(\frac{7}{5}\right)^m = n \Rightarrow m = \log_{\left(\frac{7}{5}\right)}(n)$$

$$24) 10^a = b \Rightarrow a = \log(b)$$

$$26) \log_3(x) = 2 \Rightarrow x = 3^2 = \underline{\underline{9}}$$

$$28) \log_5(x) = 2 \Rightarrow x = 5^2 = \underline{\underline{25}}$$

$$30) \log_2(x) = 6 \Rightarrow x = 2^6 = \underline{\underline{64}}$$

$$32) \log_{18}(x) = 2 \Rightarrow x = (18)^2 = \underline{\underline{324}}$$

$$34) \log(x) = 3 \Rightarrow x = 10^3 = \underline{\underline{1000}}$$

$$36) \log(100^8) = \log((10^2)^8) = \log(10^{16}) = \underline{\underline{16}}$$

$$38) 2 \log(0.0001) = 2 \log\left(\frac{1}{10000}\right) = 2 \log\left(\frac{1}{10^4}\right) \\ = 2 \log(10^{-4}) = 2(-4) = \underline{\underline{-8}}$$

$$40) \ln(e^{-5.03}) = \underline{\underline{-5.03}}$$

$$42) \log_3\left(\frac{1}{27}\right) = \log_3\left(\frac{1}{3^3}\right) = \log_3(3^{-3}) = \underline{\underline{-3}}$$

$$44) \log_2\left(\frac{1}{8}\right) + 4 = \log_2\left(\frac{1}{2^3}\right) + 4 = \log_2(2^{-3}) + 4 \\ = -3 + 4 = \underline{\underline{1}}$$

$$46) \log(10000) = \log(10^4) = \underline{\underline{4}}$$

$$48) \log(1) + 7 = 0 + 7 = \underline{\underline{7}}$$

$$50) \ln(e^{\frac{1}{3}}) = \underline{\underline{\frac{1}{3}}}$$

$$52) \ln(e^{-0.225}) - 3 = -0.225 - 3 = \underline{\underline{-3.225}}$$