

74. The line has x -intercept at $x = e^0 = 1$. When $x = e^a$, $y = \ln e^a = a$. Therefore, using the point-slope equation, we have $y - 0 = \frac{a - 0}{e^a - 1}(x - 1) \Leftrightarrow y = \frac{a}{e^a - 1}(x - 1)$.
76. $0.2 \leq \log x < 2 \Leftrightarrow 10^{0.2} \leq x < 10^2 \Leftrightarrow \sqrt[5]{10} \leq x < 100$.
78. $f(x) = 2^{3^x}$. Then $y = 2^{3^x} \Leftrightarrow \log_2 y = 3^x \Leftrightarrow \log_3(\log_2 y) = x$, and so the inverse function is $f^{-1}(x) = \log_3(\log_2 x)$. Since $\log_3 y$ is defined only when $y > 0$, we have $\log_2 x > 0 \Leftrightarrow x > 1$. Therefore the domain is $(1, \infty)$, and the range is $(-\infty, \infty)$.