2) Find T_3 for $f(x) = \log(x)$ about $x = 10$.

$$T_3 = f(a) + f'(a)(x-a) + \frac{f''(a)}{2!}(x-a)^2 + \frac{f'''(a)}{3!}(x-a)^3$$

$f(x) = \log(x)$ $\qquad f(10) = 1$

$f'(x) = \dfrac{1}{x \ln(10)}$ $\qquad f'(10) = \dfrac{1}{10 \ln(10)}$

$f'' = \dfrac{-1}{x^2 \ln(10)}$ $\qquad f''(10) = \dfrac{-1}{100 \ln(10)}$

$f''' = \dfrac{2}{x^3 \ln(10)}$ $\qquad f'''(10) = \dfrac{2}{10^3 \ln(10)}$

$$T_3 = 1 + \frac{1}{10 \ln(10)}(x-10) + \frac{-1}{2! \, 10^2 \ln(10)}(x-10)^2 + \frac{2}{3! \, 10^3 \ln(10)}(x-10)^3$$