Math 113 Homework 6 ● Due: 24 December 2004 Friday class hour. ● Instructor: Sertöz

Q-1) Write $\dfrac{df}{dx}$. Do not simplify your answer. No partial credits.

$$f(x) = x^x + 3^x + x^3.$$

Solution:

$$f'(x) = x^x \left(\ln x + 1 \right) + 3^x \ln 3 + 3\, x^2$$

Q-2) Write $\dfrac{df}{dx}$. Do not simplify your answer. No partial credits.

$$f(x) = (\cosh x)^{\sinh x}.$$

Solution:

$$f'(x) = (\cosh x)^{\sinh x} \left(\cosh x \ln (\cosh x) + \frac{(\sinh x)^2}{\cosh x} \right)$$

Q-3) Write $\dfrac{df}{dx}$. Do not simplify your answer. No partial credits.

$$f(x) = (\ln x)^{\arctan(x)}.$$

Solution:

$$f'(x) = (\ln x)^{\arctan x} \left(\frac{\ln (\ln x)}{1 + x^2} + \frac{\arctan x}{x \ln x} \right)$$

Q-4) Write $\dfrac{df}{dx}$. Do not simplify your answer. No partial credits.

$$f(x) = (\sin x)^{(\cos x)^x}.$$

Solution:

$$f'(x) = (\sin x)^{(\cos x)^x} \left((\cos x)^x \left(\ln (\cos x) - \frac{x \sin x}{\cos x} \right) \ln (\sin x) + \frac{(\cos x)^x \cos x}{\sin x} \right)$$