MATH 31B: Week 1

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Questions

Question 1. Without a calculator, calculate the following

(a) $\log_3(27)$

(b) $\ln(e^3) + \ln(e^4)$

(c) $\log_7(49^2)$

Question 2. Solve for the unknown.

1. $2^{x^2-2x} = 8$
2. $\ln(x^4) - \ln(x^2) = 2$

Question 3. Differentiate the following

(a) $f(x) = e^{\cos(x)}$

(b) $f(x) = 2^x$, hint $2 = e^{\ln(2)}$.

(c) $f(x) = \ln(3x^3 + 2x)$

(d) $f(x) = \ln\left(\dfrac{x^2+1}{x-1}\right)$

Homework Questions

7.2.5, 7.1.31, 7.1.48, 7.3.22, 7.3.29, 7.3.73

Extra Questions

Question 4. For each of the following functions, determine if they have an inverse or not. If they do, find it. If they don't, restrict the domain such that they do have an inverse and then find it.

(a) $f(x) = x^3 + 3$,

(b) $f(x) = (x-3)^2$,

(c) $f(x) = \dfrac{3x+2}{5x-1}$. Note that the domain of this function is $D = \{x : x \neq \frac{1}{5}\}$.

Question 5. What is the derivative of $f(x) = x^x$?