Quiz #3, Math 110, February 26, 1996 Name

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1. Solve $\ln(x^2 - 1) = 2$ for x.

2. Compute the derivative of $f(x) = e^{x^2 - 2x}$. After having done so, determine the critical numbers of f(x). Does the function have a local maximum, minimum, or neither at $x = 1$? Explain why. What is the (absolute) minimum value of the function f(x) ?

3. You are given that the disintegration constant of radon–220 is $\lambda = 0.0128$ in $(\text{seconds})^{-1}$. What fraction of an initial amount y_0 of a sample of radium–220 was left after 5 minutes ?

4. In an experiment with radon–220, Rutherford made the following measurements for the decay rate $y'(t)$ of the sample he was testing : at $t = 40$ seconds, $\frac{y'(t)}{y'(0)} = 0.60$, and at $t = 80$ seconds, $\frac{y'(t)}{y'(0)} = 0.36$. How did he use this information to conclude that the disintegration constant of radon–220 is $\lambda = 0.0128$ in $(\text{seconds})^{-1}$.