PRACTICE EXAM 2

No calculators. Show your work (on the test or on an attached piece of paper.) 10 points per problem.

1. Evaluate $\displaystyle\int \frac{dx}{2\sqrt{x}+2x}$.

2. what is the derivative of $y = x^x$?

3. Implicitly differentiate $\ln y = e^y \sin x$ and find $\dfrac{dy}{dx}$ as a function of x and y.

4. Evaluate $\displaystyle\int_0^{\frac{1}{2\sqrt{2}}} \frac{dx}{\sqrt{1-4x^2}}$.

5. Solve the differential equation $\dfrac{dy}{dx} = e^{x-y}$ by finding a solution $y(x)$ so that $y(0) = 0$.

6. Evaluate $\displaystyle\int \ln x \, dx$.

7. Evaluate $\displaystyle\int \frac{2x^3}{x^2-1}\,dx$.

8. Evaluate $\displaystyle\int \frac{dy}{\sqrt{9+y^2}}$. (Show work.)

9. Define $\sinh(x)$ in terms of exponential functions. (No work required.)

10. $\displaystyle\int_1^\infty \frac{dx}{x^p}$ converges if and only if p satisfies what condition? (No work required.)