

Math 119 Recitation 14

December 22, 2006

1. Evaluate the integral $\int_0^\infty \frac{x \arctan x}{(1+x^2)^2} dx$.
2. Evaluate $\int_3^\infty \frac{dx}{x\sqrt{x^2-9}}$.
3. Test the integral $\int_0^\infty \frac{dx}{\sqrt{x}+(\sqrt{x})^2}$ for convergence.
4. Show that the integral
 - (a) $\int_0^\infty \frac{\cos x}{x^2+1} dx$ converges absolutely.
 - (b) $\int_0^\infty \frac{\sin x}{x} dx$ converges.
5. Find the length of the curve $y = \ln x$, for $1 \leq x \leq \sqrt{3}$.
6. Find the length of the curve $y = \ln\left(\frac{e^x+1}{e^x-1}\right)$, from $x = 1$ to $x = 2$.
7. Find the area of the surface obtained by rotating the curve $x = \frac{1}{3}(y^2+2)^{3/2}$, from $y = 1$ to $y = 2$ about the x -axis.