PRINT Your Name:____________________________________

Quiz – October 1, 2004

Find

$$\int \arctan x \, dx.$$

Check your answer.

Answer: Use integration by parts

$$\int u \, dv = uv - \int v \, du.$$

Take $u = \arctan x$ and $dv = dx$. It follows that $du = \frac{dx}{1+x^2}$ and $v = x$. The original integral equals

$$x \arctan x - \int \frac{x dx}{1+x^2} = \boxed{x \arctan x - \frac{1}{2} \ln(1 + x^2) + C}.$$

Check: The derivative of the proposed answer is

$$\frac{x}{1+x^2} + \arctan x - \frac{1}{2} \frac{2x}{1+x^2}. \checkmark$$