1014-Z1-556 **Theodore S. Erickson*** (erickson@wju.edu), Wheeling Jesuit University, 316 Washington Avenue, Wheeling, WV 26003. *Riemann Sums of Transcendental Functions.* Preliminary report.

In Calculus I, the Riemann sums of polynomial functions are developed fully before the Fundamental Theorem of Integral Calculus. However, the Riemann sums for the exponential and trigonometric functions are rarely computed. It is not too surprising that the Riemann sum for the exponential function is a geometric series which contains a term $\frac{\Delta x}{e^{\Delta x}-1}$. This is of course the reciprocal of the ratio one obtains in the differential quotient of e^x. The Riemann sum of the sine and cosine functions require a lesser known formula that can easily be proven by induction. Likewise, these formulae include a term that is equivalent to $\frac{\Delta x}{\sin \Delta x}$. Exploration of these Riemann sums was stimulated while teaching Calculus I by reversing the order of topics: series, Riemann sums, derivatives and the Fundamental Theorem. (Received September 20, 2005)