Meeting: 1003, Atlanta, Georgia, MAA CP X1, MAA General Contributed Paper Session, I

1003-X1-296 **Michael A. Brilleslyper*** (mike.brilleslyper@usafa.edu). *The Partial Sums of* $\sum_{k=1}^{\infty} \sin(kx)$ *and their Relationship to the Saw-Tooth Function.*

The Fourier series for the saw-tooth function fails to converge uniformly on any interval containing a discontinuity of the original piecewise function. Graphically this is clear. However, examining the series fails to provide any clues why this should be the case. The answer lies in the fact that the partial sums of $\sum_{k=1}^{\infty} \sin(kx)$ are unbounded as x approaches zero. We provide a novel explanation of this result using basic ideas about Riemann sums. (Received September 08, 2004)