To be handed in no later than 9:21 a.m., Wednesday, August 4

For a certain eccentrically loaded, pinned-end column, the maximum permissible axial load x is the smallest positive root of the equation

$$x - \frac{40,000}{1 + e \sec[\frac{L}{2}\sqrt{\frac{x}{E}}]} = 0,$$

where e > 0 is the eccentricity of the loading, *L* is the length of the column, and $E = 30 \ 10^6$ is Young's modulus. Find *x* for the following values of *L* and *e*:

e = 0.3 and L = 50.0, 100.0, 150.0 and 200. 0. e = 0.1 and L = 50.0, 100.0, 150.0, and 200.0 e = 0.05 and L = 50.0, 100.0, 150.0, and 200.0. e = 0.01 and L = 50.0, 100.0, 150.0, and 200.0.

[Reference: Higdon, Ohlsen, Stiles, and Weese, *Mechanics of Materials*, pp. 430-432.]