Problem of the Week — October 27, 2009

If $k \geq 1$, the graphs of $y = \sin x$ and $y = ke^{-x}$ intersect for $x \geq 0$. Find the *smallest* value of k for which these two graphs are tangent. In addition to the value of k, find the coordinates of the point of tangency. Your final calculations should result in exact values with no numerical approximations.

Solutions accepted until 4 pm 11/06/09

You may submit complete solutions to Brian Jones or Marie Snipes either via email or hard copy; however, if you submit a hard copy, it must have a time-stamp (i.e. either electronic proof of time printed or a faculty signature verifying the time submitted.)