Do the On-line Assignment “HW #10.”

Pencil-and-Paper problems:

Do problems 12.59, 12.72, and the supplemental problem below. (These will count for 20 points each.)

S1

A satellite is to be launched into an orbit about Earth having a closest approach one Earth radius \( R_E \) above the Earth’s surface and reaching a greatest distance of 5 \( R_E \) above the surface. (a) Sketch the orbit, labeling the points of closest approach and maximum distance, and including Earth in your sketch. (b) What speed must the satellite have at the point of closest approach in order to follow this orbit? (You may give either a symbolic or numerical answer.) Hint: use conservation of energy \textit{and} conservation of angular momentum.

Please write \textbf{NEATLY} and show your work \textbf{CLEARLY}. I won’t give you credit if I can’t follow your work. Staple your pages together.

\textbf{Academic Honesty}

You may use, without proof, any results from class or your text by simply quoting the result and giving the reference (e.g. equation number or page number). You should understand \textit{how} that result was obtained, but you need not transcribe the derivation.

If you get bogged down with any of the problems, do not hesitate to discuss them with me or with a fellow student. However, if you discuss a problem with \textit{anyone} (besides me) you should acknowledge that collaboration. Please see the Academic Honesty policy for more information about appropriate and inappropriate collaboration.