Clarifications for Problem Set #1

C249: Planetary Astrophysics

General Advice: If you get stuck, please send me an email, ask a question in class, or come to office hours. Let me know if you find yourself spending an unreasonable amount of time on a single problem.

Question 2: Your plots of the systems should be 2-dimensional versions like the cartoon sketch below. For planets with unknown eccentricities, assume e=0. You can ignore differences in the orientations of each orbit and simply assume that all of the planets orbit in the plane of the paper. Feel free to add a note if the planets actually have large mutual inclinations. Using the correct longitudes of periastron would be ideal, but it's okay to assume $\varpi = 0$.

Question 3: Assume that Earth and Mars have circular orbits. We're assuming that "arriving at Mars" is equivalent to reaching the point in space where the orbit of Mars intersects the Hohmann Transfer orbit. (i.e., you don't need to worry about how to enter Mars orbit or land on the surface)

Question 4: Note that there's a typo in Equation 10 of the "Astrometric Detection and Characterization of Exoplanets" chapter of the textbook. The prefactor $(2P/\pi)$ should be $(2\pi/P)$. The correct equation is $E = (2\pi/P)(t-T) + e \sin E$.

Question 4b: You'll need to assume a distance. I picked 10 pc, but you can pick any distance as long as you state your chosen value.

Question 4c: Students without significant programming experience can explain in words how they would create the figures rather than generating their own copies. Drawing a flow-chart might be helpful.

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