Physics 10273 040/640 - Module 7 Quiz A

1. (25 pts) From your textbook's discussion of exoplanets, (a) explain how we determine the approximate size of transiting exoplanets and (b) explain how we deduce the density of these exoplanets to determine if they are rocky or gaseous?

2. (25 pts) In the video about the discovery of an Earth-like planet by the TESS mission, they described how future observers might tell the difference between a rocky or watery world. They predict that the mostly-rocky world will have an extra feature in its spectrum that wouldn't appear in a mostly-water world. What atom or molecule is responsible for this extra spectral signature? No explanation needed for this one.

3. (25 pts) Based on your reading of the Kepler mission FAQ, describe what is the primary difference between a "natural" variation in brightness and a variation in brightness caused by a transiting exoplanet.

4. (25 pts) When we observe exoplanets via the Doppler wobble technique, the systems are usually tilted with respect to our line of sight. (a) Explain why the tilt makes our estimates of the planetary companion mass too small, and (b) explain why planets that transit their parent stars don't have this problem.