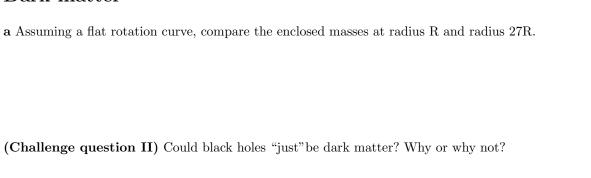
hole? Try to resolve this conundrum.

Black holes

(a) If the Sun were replaced by a black hole, what would happen?
(b) Per general relativity: gravity affects both light and mass. If you were standing on a neutron star and pointed a flashlight upward, what happens to the photons? Do they continue on at the same speed? The same energy?
(c) Draw the anatomy of a black hole.
(d) Your friend falls into a black hole. Draw what you would see.
(e) You are standing, somehow, on the surface of a black hole with an accretion disk around it. Name three sources of danger.
(Challenge question) The "no-hair" theorem stipulates that black holes can only be characterized by their mass, angular momentum, and charge. But charges inside a black hole shouldn't affect charged bodies outside the black hole — wouldn't they do so via EM radiation, which can't "escape" a black

Dark matter



(Challenge question III) Back to exoplanets (I forgot to ask this question earlier!). Say that we are observing a binary star system in which an exoplanet orbits one of the stars. Using the flux of each star, the size of one star, and the size of a planet, calculate the fractional dip in the total light that we measure.

(Challenge question IV) Another exoplanet question. If we are observing one planet transit a star, can we detect the presence of a non-transiting planet? If so, what property/properties of that non-transiting planet can we determine? How do those properties relate to the parameters of our observations?