

Terrestrial Transit (15 points).

Note: Assume perfect circular orbits in both questions below.

10.1 An alien astronomer from a distant planetary system is observing the Sun. Suddenly, the brightness of the Sun drops due to the transit of the Earth in front of it. What is the maximum duration that this transit may last (in hours)? Assume that the planet where the astronomer observes from, does not move relative to the Sun. 5.0pt

10.2 Imagine that the transit of a given exoplanet as seen from Earth lasts 31 minutes. The host star is a red dwarf, with mass and radius that are 10% of the mass and radius of the Sun. What is the minimum orbital period this exoplanet may have (in days)? 10.0pt