Level 2 Stars

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Problem Set S.2

(1) How does the period of a binary system depend on the separation between the two stars? Calculate the period of a binary system with two solar mass stars separated by 10 AU. [3 marks]

(2) List four possible signatures that a stellar system actually consists of two or more stars. [4 marks]

(3) In an eclipsing binary system, the time taken for the light to drop from uneclipsed to fully eclipsed is 7 hrs. The relative velocity for the smaller star with respect to the larger star is 80 km s^{-1}. What is the radius of the smaller star? [3 marks]

[$M_{\odot}$ = 1.99 x 10^{30} kg; AU = 1.50 x 10^{11} m; G = 6.67 x 10^{-11} N m^2 kg^{-2}]