AST 250 – Spring 2019
Homework Due: Friday March 15

21. The Period-Luminosity relationship has been calibrated using the parallax to nearby to Cepheid variables (given in absolute visual magnitude as; Benedict et al. 2007):

$$M_V = -2.43(\log_{10}(P_{days}) - 1) - 4.05$$

Assume that you observe a classical Cepheid variable in the Andromeda Galaxy (M31) with an *apparent* visual magnitude of $m_v = +19.3$ and a period of 29 days.

(a) How far away is this star (give answer in Mly = 1 million light years)?

(b) What is the luminosity of the Cepheid (give answer in L_{sun})?

(Note: In reality, there is dust in both the Milky Way and M31 which attenuates the light slightly which you must account for to do this more accurately).