

Answer on question #54919, Physics / Astronomy — Astrophysics

Question Altair in the constellation Cygnus is 16.4 LY distant with an apparent magnitude $m = +0.8$ and absolute magnitude $M = +2.3$. Verify its absolute magnitude using the inverse square law for light.

Solution Apparent m and absolute M magnitudes are related as

$$M = m - 5((\log_{10} D_L) - 1)$$

where D_L is distance in parsecs. In our case $D_L \approx 5.028$ pc. Hence

$$M = 0.8 - 5((\log_{10} 5.028) - 1) = 0.8 + 1.5 = 2.3$$

Indeed, absolute magnitude is 2.3.