

HW2, #1

The Sun has apparent mag

$$m_v = -26.71$$

and distance

$$d = 4.85 \times 10^{-6} \text{ pc}$$

Absolute mag is

$$m_v - M_v = 5 \log d - 5$$

$$\rightarrow M_v = m_v - 5 \log d + 5$$

$$= -26.71 - 5 \log (4.85 \times 10^{-6}) + 5$$

$$M_v = +4.86$$

Using data from Hipparcos, we can guess the distances of other stars in the following manner:

- assume they have same abs mag M_v as Sun
- look up apparent mag
- use distance modulus to compute distance

We'll then compare those guesses to the real distances

Star	m_v	$(m_v - M_v)$	guess dist (pc)	actual dist (pc)	Is star really identical to Sun
Rigel	+0.18	-4.68	1.16	237	no, <u>more</u> luminous
α Cen A	-0.01	-4.87	1.06	1.34	yes, close
40 Eri	+4.43	-0.43	8.20	5.05	no, <u>less</u> luminous