

Given the relation between the magnitude difference and flux ratio,

$$m_1 - m_2 = 2.5 \log f_2/f_1$$

since the flux is inversely proportional to the distance square,

$$f_2/f_1 \propto d_1/d_2$$

and $m_2 \equiv M, d \equiv 10$ pc

so, $m - M = 2.5 \log(d_1/10)^2 = 5 \log d - 5$