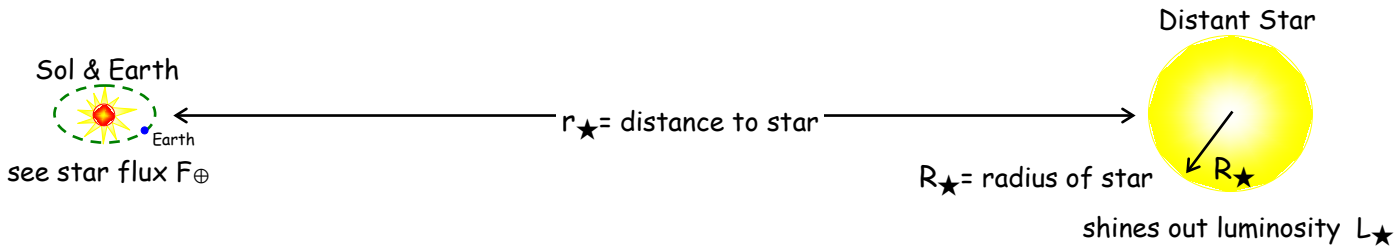
 Name _____

STAR MAGNITUDES, LUMINOSITIES, AND FLUXES



LUMINOSITY AND MAGNITUDES

The luminosity of a star can be found using that of the sun and their magnitudes: M_{SOL} = _____

LUMINOSITY IN SOLAR LUMINOSITIES

$$L_{\star,sl} = (10^{\left(\frac{M_{SOL} - M_{\star}}{2.5}\right)}) \text{ Solar Luminosities} \quad \text{Eqn. (1)}$$

same

LUMINOSITY IN WATTS

$$L_{\star,W} = L_{\star,sl} \times (3.827 \times 10^{26}) \text{ Watts} \quad \text{Eqn. (2)}$$

WARNING!! USE $\times 10^{x}$ OR EE KEY (NOT ×10^(26))

THE FLUX OF A STAR AT EARTH

The relationship between the luminosity of a star and the flux received at Earth is given by the inverse square law,

STAR FLUX AT THE EARTH

$$F_{\oplus} = \frac{L_{\star,W}}{4\pi(r_{\star}^{2})} \quad \frac{\text{Watts}}{(\text{meter})^2} \quad \text{Eqn. (3)}$$

$r_{\star}$ must be in meters!

using **1 light year = 9.46 x 10^{15} meters** and L_{SOL} = **3.827×10^{26} Watts**

STAR	FIELD GUIDE TO THE STARS AND PLANETS APPENDIX A2			CALCULATED			
	V	M_V	r_* (ly)	r_* meters	$L_{\star,sl}$ (Eqn. 1) solar lum's	$L_{\star}$ (Eqn. 2) Watts	$F_{\oplus}$ (Eqn. 3) W/m^2
Polaris (α UMi)	2.0	-4.1	431				
Vega (α Lyra)	0.03	0.6	25				
Deneb (α Cyg)	1.25	-7.5	1467				
Altair (α Aql)	0.77	2.1	17				
Betelgeuse (α Ori)	0.5	-5.0	522				

Which of the Luminosities (compared to Sol) is noteworthy?

Should we warn people about starburn and sell "SPF 0.01 Starblock"?