

Name: \_\_\_\_\_ Period: \_\_\_\_\_ Date: \_\_\_\_\_

### Astronomy Chapter 13 Worksheet

Show your works to receive full credit. Here are the stinking equations:

$$d_{pc} = 1/p_{arc\ seconds} \quad B = \sigma T^4 \quad L = 4\pi R^2 \sigma T^4$$

1 pc = 3.26 ly  $(5.67 \times 10^{-8} \text{ watts m}^{-2}\text{K}^{-4})$

$$B = \frac{L}{4\pi d^2} \quad B = \frac{L}{4\pi R^2} \quad \frac{R_s}{P_\odot} = \left(\frac{L_s}{L_\odot}\right)^{1/2} \left(\frac{T_\odot}{T_s}\right)^2$$

- 1) Sirius has a parallax of 0.377 arc seconds. How far away is it in light years?
- 2) The parallax of Proxima Centauri is about 0.763 arc seconds. What is its distance?
- 3) Vega is 7.69 parsec away. Determine its parallax.
- 4) A stellar companion of Sirius has a temperature of about 10,000 K and has a luminosity 25x more than that of our Sun. What is its radius in relation to that of our Sun?
- 5) What is the brightness of Polaris if its temperature is 6021 K?
- 6) Polaris has a radius of 35 million **km**. What is its luminosity?

- 7) If the temperature of Regulus is 12042 K, what is its brightness?
- 8) Alcor has a luminosity of  $5.15 \times 10^{27}$  W and a radius of 1.23 million km. What is its brightness?
- 9) What is Alcor's surface temperature?
- 10) What is the luminosity of Alpha Centauri A, with respect to our Sun, if its radius is 1.2 times that of our Sun, and a surface temperature of 5780 K?
- 11) Deneb has a temperature of 8500 K and a luminosity of 307444 times that of the Sun. What is its radius with respect to our Sun?
- 12) The parallax of Altair is about 0.194 arc seconds. What is its distance in both parsecs and lightyears?
- 13) Canopus has a radius of about 67 times that of our Sun, and luminosity of 14751 times bigger than our Sun. What is its surface temperature?