

1 Quantitative

1. Relationship between frequency, wavelength and velocity of a wave:

$$\lambda \cdot f = v \quad (1)$$

2. Energy of a photon:

$$E = h \cdot f \quad (2)$$

3. Parallax formula

$$\text{Distance (pc)} = \frac{1}{\text{Parallax (arcsec)}} \quad (3)$$

4. Doppler shift formula:

$$\frac{\lambda_v - \lambda_0}{\lambda_0} = \frac{v}{c} \quad (4)$$

5. Wien's Law:

$$\lambda_{\text{max}} = \frac{2.9 \times 10^6 \text{nm K}}{T} \quad (5)$$

6. Stefan-Boltzmann Law

$$j = \sigma T^4 \quad (6)$$

7. Escape velocity formula

$$V_{\text{escape}} = \sqrt{\frac{2GM}{R}} \quad (7)$$

8. Flux / apparent brightness formula

$$F = \frac{L}{4\pi D^2} \quad (8)$$

9. Luminosity of spherical black body:

$$L = 4\pi R^2 \sigma T^4 \quad (9)$$

10. Angular momentum:

$$L = I\omega \quad (10)$$

$$I = \frac{2}{5}MR^2 \quad (11)$$

$$\omega = \frac{2\pi}{P} \quad (12)$$

11. Time dilation:

$$T = \frac{T_0}{\sqrt{1 - (v/c)^2}} \quad (13)$$

12. Length contraction

$$L = L_0 \sqrt{1 - (v/c)^2} \quad (14)$$

13. Apparent mass

$$M = \frac{M_0}{\sqrt{1 - (v/c)^2}} \quad (15)$$

2 Qualitative

1. Electromagnetic spectrum, order of radiation types
2. Phases of the moon
3. Energy levels of an atom & how that effects the spectra of an object.
4. Low mass and high mass stellar evolution. See posted summaries of these.
5. HR Diagram. OBAFGKM sequence.
6. Binary stars. What extra information do we get about stars that are in binary systems?
7. Fusion, pp chain, CNO cycle
8. Neutrinos
9. Stellar wind
10. Mass transfer
11. Supernovae, nova