**Astrophysics**

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| 193 nm | 1. What is the wavelength of the blackbody peak for Doofus Major with a temperature of 15,000 K? |
| 6400 K | 2. What is the temperature of the surface of Balderdash if the black body peak is 450 nm? |
| 2.4 x 1027 W | 3. Sillius has a temperature of 8300 K, and a radius of 8.4 x 108 m. What is its luminosity? |
| 2.4 x 1010 m | 4. Alpo Yumae has a luminosity of 3.7 x 1029 W, and a Temperature of 5600 K. What is its radius? |
| 1.0 x 10-10 W/m2 | 5 Eta Peanut has a Luminosity of 1.9 x 1027 W. What is its brightness if it is 130 Ly away? |
| 6.2 x 1024 W | 6. Weurmgeuse has a brightness of 1.3 x 10-12 W/m2 , What is its luminosity if it is 65 Ly away? |
| 6.4 x 1018 m | 7. Canis Fetchus has a brightness of 4.5 x 10-12 W/m2 , and a Luminosity of 2.3 x 1027 W. How far away is it? |
| 22 | 8. What is the apparent magnitude of Canopeas if it has a brightness of 3.5 x 10-17 W/m2? |
| 1.6 x 10-17 W/m2 | 9. Alpha Beta has an apparent magnitude of 23. What is its brightness? |
| -.3 | 10 Twentieth Centauri is 450 parsecs away, and has an apparent magnitude of 8. What is its absolute magnitude? |
| 1.0 x 105 pc | 11 Cepheid Variable has an absolute magnitude of -3. How far away is it if it has an apparent magnitude of 17? |
| 1.7 | 12. Cepheus Firmea has a absolute magnitude of –2.5. What is its apparent magnitude if it is 230 Ly away from us? |
| 6  160 pc | 13. Irregulus with a surface temperature of 5000 K has what absolute magnitude according to the HR diagram at the bottom of the page? How far away is it if it has an apparent magnitude of 12? |
| 3  40000 pc | 14. Cetus Naue with a surface temperature of 7000 K has what absolute magnitude according to the HR diagram at the bottom of the page? How far away is it if it has an apparent magnitude of 21? |
| 4.00 Hz  Sharp  444 Hz | 15. A very strong concertmaster is playing 440.00 Hz at the top of an 4.50 m tall tower on a neutron star where the “g” is 1.816 x 1014 N/kg. We are at the bottom also playing 440.00 Hz. What is the beat frequency we hear? Do we hear the player on the top of the tower as sharp or flat? What frequency do we observe? |
| 4.13 x 1013 N/kg  Higher | 16. If we are living on a neutron star, and we tune the local station “Neutrock 91.7 (MHz) in at 90.2 on our FM Dial. We know that we are at a different elevation by 35.6 m. What is the “g” here? Are we higher or lower than the broadcast antenna of “Neutrock” |
| 1.02 x 1013 Hz  8520 N/kg | 17. A 417 nm spectral line is shifted to 423 nm through a distance of 1 A.U. What is the change in frequency? What is the “g” in the vicinity of source? |
| 8.2 hours | 18. A black hole has a Schwarzschild radius of 39 km. What time does it take a clock 83 km from the center of the black hole to register 6.0 hours as we observe it from a distance? |
| 40.5 km  2.73x1031 kg | 19. A clock takes 173 minutes to register 120. minutes as we see it from a distance. It is 78.0 km from a black hole. What is the Schwarzschild radius of this black hole? What is its mass? |
| 9.1x1030 kg | 20. A star orbiting 89 km from a black hole has a 656 nm line spectral that has gravitationally red-shifted to 712 nm. What is the mass of the black hole? (Use v = fλ and f = 1/T to find the periods of 656 and 661 nm) |

