

Astronomical Ideas – Math Review practice problems

1. The radius of the Sun is 100 times the Earth's radius. What is the volume of the Sun, relative to the volume of the Earth?
2. How many days does it take to travel $9.46 * 10^{12}$ km at a speed of $3 * 10^8$ m/sec?
3. If you replaced the Earth with a planet of the same mass but three times larger in radius, how would the force of gravity felt by us change?
4. Star B is 10^4 times farther away from Earth than the Sun. Precision measurements reveal that the angular size of Star B is 10^{-3} degrees across. The angular size of the Sun is 0.5 degrees across. How physically large is Star B relative to the Sun?
5. Two stars have the same apparent brightness in the sky, but Star A is 6 times farther away than Star B. What must the intrinsic luminosity of Star A be compared to that of Star B?
6. Vega is 25 light years away and is the fifth brightest star in the sky. It has twice the mass of the Sun, and is 37 times more intrinsically luminous than the Sun (there are $6 * 10^5$ AU per light year). What is the apparent brightness of Vega relative to that of the Sun?