

PRACTICE 1A

DIRECTIONS: PLEASE SHOW YOUR WORK ON EVERY PROBLEM

1. It is estimated that the sun will exhaust all of its energy in about 10 billion years. By that time, it will have radiated about 1.2×10^{44} J (joules) of energy. Express this amount of energy in a. kilojoules and b. nanojoules
2. The smallest living organism discovered so far is called a *mycoplasma*. Its mass is estimated as 1.0×10^{-16} g. Express this mass in a. petagrams b. femtograms c. attograms
3. The “extreme” prefixes that are officially recognized are *yocto*, which indicates fractions equal to 10^{-24} , and *yotta*, which indicates a factor equal to 10^{24} . The maximum distance from Earth to the sun is 152,100,000 km. Using scientific notation, express this distance in a. yoctometers (ym) and b. yottameters (Ym).
4. How many centimeters are in a kilometer?
5. Convert 2 km/hr to m/s.
6. How many inches are in a meter, given that there are 2.54 cm in 1 inch?
7. In 1993, the total production of nuclear energy in the world was 2.1×10^{15} watt-hours, where a watt is equal to one joule (J) per second. Express this number in a. joules b. gigajoules