

Physics Problem Set 1 - due Mon. April 4 by 6pm (8964065)

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1. Question Details OScolPhys1 1.P.001.WA. [2707446]

The speed limit on certain interstate highways is 80 miles per hour.

(a) What is this in feet per second?

 117 ft/s

(b) How many kilometers per hour is this?

 129 km/h

Supporting Materials

[Physical Constants](#)

2. Question Details OScolPhys1 1.P.002.WA. [2707295]

A car is traveling at a speed of 59 feet per second.

(a) What is its speed in kilometers per hour?

 64.7 km/h

(b) Is it exceeding the 45 mile per hour speed limit?

 Yes No

Supporting Materials

[Physical Constants](#)

3. Question Details OScolPhys1 1.P.003.WA. [2707368]

Soccer fields vary in size. A large soccer field is 102 meters long and 82 meters wide. What are its dimensions in feet?

length 335 ftwidth 269 ft

What are its dimensions in inches?

length 4020 inwidth 3230 in

Supporting Materials

[Physical Constants](#)

4. Question Details OScolPhys1 1.P.004.WA. [2707330]

What is the height in meters of a 6-foot-1-inch tall person?

 1.85 m

Supporting Materials

[Physical Constants](#)

5. Question Details OScolPhys1 1.P.005.WA. [2707415]

Mount Everest, at 29,028 feet, is the tallest mountain on Earth. What is its height in kilometers?

 km

Supporting Materials

[Physical Constants](#)

6. Question Details OScolPhys1 1.P.006.WA. [2707413]

Tectonic plates are large segments of the Earth's crust that move slowly. Suppose one such plate has an average speed of 3.4 cm per year.

(a) What distance does it move in 65 seconds at this speed?

 7.00e-08 m

(b) What is its speed in miles per million years?

 21.1 mi/million yr

Supporting Materials

[Physical Constants](#)

7. Question Details OScolPhys1 1.2.008. [3203534]

The speed of sound is measured to be 339 m/s on a certain day. What is this in km/h?

 1220 km/h

8. Question Details OScolPhys1 1.3.023. [3203532]

If a marathon runner averages 9.0 mi/h, how long does it take him or her to run a 26.22-mi marathon?

 2.91 h

9. Question Details OSColPhys1 1.4.007.XP. [2153531]

Solve this problem using data from table 1.3 in your text.

(a) What is the ratio of the distance to the nearest galaxy to the size of the Milky Way galaxy? This is typical of the distances between galaxies as compared with their sizes.

$$d_{\text{gal}}/d_{\text{MW}} = \text{[]} \text{ []}$$

(b) What is the ratio of the size of the Milky Way to the distance to the sun?

$$d_{\text{MW}}/d_{\text{sun}} = \text{[]} \text{ []}$$

(c) What is the ratio of the distance to Andromeda to the distance to the sun?

$$d_{\text{gal}}/d_{\text{sun}} = \text{[]} \text{ []}$$

10. Question Details OSColPhys1 1.P.024.WA. [2707429]

How many times longer than the mean life of an extremely unstable nucleus is the age of the Earth? (Use this table of magnitudes to calculate your answer.)

 1.00e+39

Supporting Materials

[Physical Constants](#)

11. Question Details OSColPhys1 1.4.012.XP. [2153512]

What is the approximate number of galaxies in the known universe, assuming that the Milky Way has an average mass and that all of the mass in the known universe is in galaxies?

 [] galaxies

12. Question Details OSColPhys1 1.4.004.XP. [2153701]

What fraction of the age of the earth is encompassed by recorded history?

 []

13. Question Details OSColPhys1 1.4.010.XP. [2153203]

If the sun's mass is about average, how many stars are there in the Milky Way galaxy?

 [] stars

14. Question Details OSColPhys1 1.4.032. [2153553]

Calculate the approximate number of atoms in a bacterium, assuming the average mass of an atom is ten times the mass of a hydrogen atom.

 [] atoms

15. Question Details OSColPhys1 1.4.035. [2153567]

(a) Calculate the number of cells in a hummingbird assuming the mass of an average cell is ten times the mass of a bacterium.

 [] cells

(b) Making the same assumption, how many cells are there in a human?

 [] cells