Homework #1 (2762326)

Question 1 2 3 4 5 6 7 8 9 10

Description
Homework #1 - Due Friday Sep.7, 2012

Instructions
Chapter 1, Problems 4, 7, 14, 23, 32, 38, 39, 44 Chapter 2, #'s 5, 11, 17

1. Question Details SerCP9 1.P.004.WI. [1678101]

Each of the following equations was given by a student during an examination. Do a dimensional analysis of each equation and explain why the equation can't be correct.

(a) $\frac{1}{2}mv^2 = \frac{1}{2}mv_0^2 + \sqrt{mgh}$

(b) $v = v_0 + at^2$

(c) $ma = v^2$

2. Question Details SerCP9 1.P.007.WI. [1678079]

A carpet is to be installed in a room of length 9.26 m and width 5.8 m. Find the area of the room retaining the proper number of significant figures.

4.0 ✓ _____ m^2

3. Question Details SerCP9 1.P.014. [1588949]

Carry out the following arithmetic operations. (Enter your answers to the correct number of significant figures.)

(a) the sum of the measured values 867, 37.7, 0.83, and 7.0

4.0 ✓ _____

(b) the product 1.5 × 2.091

4.0 ✓ _____

(c) the product 6.86 × π

4.0 ✓ _____

4. Question Details SerCP9 1.P.023. [1588512]

The speed of light is about 3.00×10^8 m/s. Convert this figure to miles per hour.

[ ] mi/h

5. Question Details SerCP9 1.P.032. [1678091]

Treat a cell in a human as a sphere of radius 1.0 μm.

(a) Determine the volume of a cell.

[ ] m^3

(b) Estimate the volume of your body. (Consider your body to be a cylinder having a radius of about 6 inches (or 0.15 m) and a height of about 1.5 meters.)

- 10^{-2} m^3
- 10^{-1} m^3
- 10^{0} m^3
- 10^{1} m^3
- 10^{2} m^3

(c) Estimate the number of cells in your body.

- 10^{14}
- 10^{16}
- 10^{18}
- 10^{19}
- 10^{20}

6. Question Details SerCP9 1.P.038.WI.soln. [1589214]

Two points in a rectangular coordinate system have the coordinates (5.1, 3.0) and (−2.8, 5.5), where the units are centimeters. Determine the distance between these points.

4.0 [ ] cm

7. Question Details SerCP9 1.P.039.soln. [1588676]

Two points are given in polar coordinates by $(r, \theta) = (1.20 \text{ m}, 50.0°)$ and $(r, \theta) = (4.60 \text{ m}, -32.0°)$, respectively. What is the distance between them?

[ ] m

8. Question Details SerCP9 2.P.005. [1588673]

Two boats start together and race across a 58-km-wide lake and back. Boat A goes across at 58 km/h and returns at 58 km/h. Boat B goes across at 29 km/h, and its crew, realizing how far behind it is getting, returns at 87 km/h. Turnaround times are negligible, and the boat that completes the round-trip first wins.

(a) Which boat wins? (Or is it a tie?)

- ○ boat A
- ○ boat B
- ○ It's a tie.

By how much?

[ ] km

(b) What is the average velocity of the winning boat?

[ ] km/h

9. Question Details SerCP9 2.P.011. [1624627]

The cheetah can reach a top speed of 114 km/h (71 mi/h). While chasing its prey in a short sprint, a cheetah starts from rest and runs 46 m in a straight line, reaching a final speed of 74 km/h.

(a) Determine the cheetah's average acceleration during the short sprint.

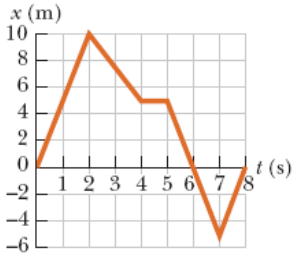
[ ] m/s^2

(b) Find its displacement at t = 3.0 s. (Assume the cheetah maintains a constant acceleration throughout the sprint.)

[ ] m

10. Question Details SerCP9 2.P.017. [1588879]

A graph of position versus time for a certain particle moving along the x-axis is shown in the figure below. Find the instantaneous velocity at the following instants.



(a) t = 1.00 s [ ] m/s

(b) t = 3.00 s [ ] m/s

(c) t = 4.50 s [ ] m/s

(d) t = 7.50 s [ ] m/s