

Homework #1 - Due Friday Sep. 6, 2013

Question

1 2 3 4 5 6 7 8 9 10 11

1. Question Details

SerCP9 1.P.004.WI.soln. [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 9.84 m and width 5.2 m. Find the area of the room retaining the proper number of significant figures.

4.0 ✓ m²

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 621, 33.8, 0.82, and 8.0

4.0 ✓

(b) the product 1.9 × 2.989

4.0 ✓

(c) the product 5.62 × 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 $1.0 \mu\text{m}$.

(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 $(4.5, 2.6)$ and $(-2.8, 4.6)$, where the units are centimeters. Determine the distance between these points.

 cm

7. Question Details

SerCP9 1.P.039.soln. [1588676]

Two points are given in polar coordinates by $(r, \theta) = (2.00 \text{ m}, 50.0^\circ)$ and $(r, \theta) = (3.00 \text{ m}, -30.0^\circ)$, respectively. What is the distance between them?

 m

8. Question Details

SerCP9 1.P.044.WI. [1588808]

A right triangle has a hypotenuse of length 2.50 m , and one of its angles is 20.0° . What are the lengths of the following sides?

(a) the side opposite the 20.0° angle

 m

(b) the side adjacent to the 20.0° angle

 m

9. Question Details

SerCP9 2.P.005. [1588673]

Two boats start together and race across a 78-km-wide lake and back. Boat A goes across at 78 km/h and returns at 78 km/h. Boat B goes across at 39 km/h, and its crew, realizing how far behind it is getting, returns at 117 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

10. 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 49 m in a straight line, reaching a final speed of 92 km/h.

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

m/s²

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

m

11. Question Details

SerCP9 2.P.014.soln. [1588663]

A tortoise can run with a speed of 0.11 m/s, and a hare can run 20 times as fast. In a race, they both start at the same time, but the hare stops to rest for 5.0 minutes. The tortoise wins by a shell (30 cm).

(a) How long does the race take?

s

(b) What is the length of the race?

m

Assignment Details

Name (AID): Homework #1 - Due Friday Sep. 6, 2013

Submissions Allowed: 5

Category: Homework

Code:

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