Questions

Chapter 1
Measurement

1-3 Changing Units
M1-042

Express speed of sound, 330 m/s in miles/h
(1 mile = 1609 m)

A) 147 miles/h
B) 330 miles/h
C) 738 miles/h
D) 0.205 miles/h
E) 980 miles/h

Answer C

1-3 Changing Units
M1-041

1 shake = 10^{-8} seconds. Find out how many nano seconds (ns) are there in 1 shake.
(1 nano = 10^{-9})

A) 0.1 ns
B) 0.01 ns
C) 100 ns
D) 0.001 ns
E) 10 ns

Answer E

1-3 Changing Units
M1-991

How many molecules of water are there in a cup containing 250 cm^3 of water?
Molecular mass of H_2O = 18 g/mole
Density of water = 1.0 g/cm^3
Avogadro s number = 6.02 x 10^{23} molecules/mole

A)6.0 x 10^{23}
B)8.4 x 10^{24}
C)1.9 x 10^{26}
D)3.7 x 10^{28}
E)2.5 x 10^{3}

Answer B

1-3 Changing Units
M1-991

Using the fact that the speed of light in space is about 3.00 x 10^8 m/s, determine how many miles light will travel in one hour.
(1 mile = 1.61 km)

A)6.71×10^8 miles
B)2.50×10^6 miles
C)5.40×10^9 miles
D)8.32×10^3 miles
E)4.83×10^2 miles

Answer A

1-4 Dimensional Analysis
M1-062

Suppose

$$A = \frac{B^n}{C^m}$$

where *A* has dimensions LT, *B* has dimensions L^2T^{-1}, and *C* has dimensions LT^2. Then the exponents *n* and *m* have the values:

A) $n = 1/5$; $m = 3/5$
B) $n = 2$; $m = 3$
C) $n = 4/5$; $m = -1/5$
D) $n = 1/5$; $m = -3/5$
E) $n = 1/2$; $m = 1/2$

Answer D

1-4 Dimensional Analysis
M1-071

The position *x* of a particle is given by: $x = B\,t^2 + \frac{C}{B}t$

where *x* is in meters and *t* is in seconds. The dimension of *C* is:

A) $\frac{L^2}{T^3}$

B) $\frac{L}{T}$

C) L

D) T

E) $\frac{L}{T^2}$

Answer A

1-7 Density
M1-062

From the fact that the average density of the Earth is 5.50 g/cm^3 and its mean radius is 6.37 $\times 10^6$ m, the mass of the Earth is:

A) $7.01 \times 10^{17}\ kg$
B) $3.98 \times 10^{21}\ kg$
C) $5.95 \times 10^{24}\ kg$
D) $2.80 \times 10^{18}\ kg$
E) $5.50 \times 10^{23}\ kg$

Answer C

1-7 Density
M1-061

An aluminum cylinder of density 2.70 g/cm^3, a radius of 2.30 cm, and a height of 1.40 m has the mass of:

A) 25.0 kg
B) 45.1 kg
C) 13.8 kg
D) 8.50 kg
E) 6.28 kg

Answer E

1-7 Density
M1-052

A nucleus of volume 3.4 x 10^3 fm^3 and mass of 1.0x 10^2 u has a density of:
(1 fm = 10-^{15} m, 1 u = 1.7 x 10^{-27} kg)

A) 5.0 $\times$ 10^{16} kg/m^3
B) 1.0 $\times$ 10^3 kg/m^3
C) 3.4 $\times$ 10^{14} kg/m^3
D) 12 $\times$ 10^3 kg/m^3
E) 3.6 $\times$ 10^{13} kg/m^3

Answer A

1-7 Density
M1-042

A cylindrical can, 6.00 inches high and 3.00 inches in diameter is filled with water. Density of water is 1.00 g/cm^3. What is the mass of water in the can in gram ?
(1 inch = 2.54 cm) .

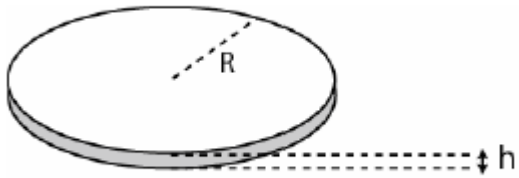
A) 277 g
B) 695 g
C) 182 g
D) 107 g
E) 2780 g

Answer B

1-7 Density
M1-041

A drop of oil (mass = 0.90 milligram and density = 918 kg/m^3) spreads out on a surface and forms a circular thin film of radius = 41.8 cm and thickness h. Find h in nano meter (nm). (1 nano = 10^{-9})

A) 0.60 nm
B) 0.00060 nm
C) 0.15 nm
D) 1.8 nm
E) 0.030 nm



Answer D