

Chapter 1 (Dimension law and conversion of unit)

- 1- A certain brand of house paint claims a coverage of $500 \text{ ft}^2 / \text{gal}$ ($1 \text{ ft} = 30.48 \text{ cm}$; $1 \text{ gal} = 3.78 \text{ liter}$). Express this quantity in m^2/liter . (A: 12.3)
- 2- Speed of sound is 330 m/s . Express this in miles per hour ($1 \text{ mile} = 1609 \text{ m}$). (A: 738 miles/h)
- 3- The average radius of a nucleus is $R = 10.0 \text{ fm}$. Find the density of the nucleus which has a mass of $15u$ [$1 \text{ fm} = 10^{-15} \text{ m}$, $1 u = 1.66 \times 10^{-27} \text{ kg}$]. (A: $5.94 \times 10^{15} \text{ kg/m}^3$)
- 4- Speed of sound is 340 m/s . Express this in millimeters per nanosecond. [$1 \text{ ns} = 10^{-9} \text{ s}$]. (A: $3.40 \times 10^4 \text{ mm/ns}$)
- 5- The standard kilogram is a platinum-iridium cylinder 39 mm in height and 19.5 mm in radius. What is the density of the material? (A: 21 g/cm^3)
- 6- During a short interval of time the velocity v in m/s of an automobile is given by $v = at^2 + bt^3$, where the time t is in seconds. The units of a and b are respectively: (A: m/s^3 ; m/s^4)
- 7- Suppose $A = BC$, where A has the dimensions L/M and C has the dimensions L/T . Then B has dimension: (A: T/M)
- 8- Suppose $A = B^n C^m$, 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: $1/5$; $3/5$)

Remember the following

Circumference of a circle

Area of a circle

Surface area of a sphere

Volume of a sphere

Surface area of a right circular cylinder

Volume of a right circular cylinder