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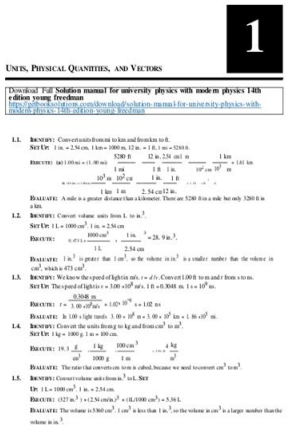
so many fake sites. this is the first one which worked! Many thanks



1

UNITS, PHYSICAL QUANTITIES, AND VECTORS

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1.1. IDENTIFY: Convert units from mi to km and from km to ft.
SET UP: 1 in. = 2.54 cm, 1 km = 1000 m, 12 in. = 1 ft, 1 mi = 5280 ft.
EXECUTE: (a) 1.00 mi = 1.00 mi $\frac{5280\ \text{ft}}{1\ \text{mi}} \frac{12\ \text{in.}}{1\ \text{ft}} \frac{2.54\ \text{cm}}{1\ \text{in.}} \frac{1\ \text{m}}{10^2\ \text{cm}} \frac{1\ \text{km}}{10^3\ \text{m}} = 1.61\ \text{km}$
1 km 1 m 2.54 cm 12 in.
EVALUATE: A mile is a greater distance than a kilometer. There are 5280 ft in a mile but only 3280 ft in a km.

1.2. IDENTIFY: Convert volume units from L to in.^{3}.
SET UP: 1 L = 1000 cm^3. 1 in. = 2.54 cm
EXECUTE: $473\ \text{L} \times \frac{1000\ \text{cm}^3}{1\ \text{L}} \times \frac{1\ \text{in.}^3}{(2.54\ \text{cm})^3} = 28.9\ \text{in.}^3$.
EVALUATE: 1 in.^{3} is greater than 1 cm^3, so the volume in in.^{3} is a smaller number than the volume in cm^3, which is 473 cm^3.

1.3. IDENTIFY: We know the speed of light in m/s. $v = d/t$. Convert 1.00 ft to m and t from s to ns.
SET UP: The speed of light is $v = 3.00 \times 10^8$ m/s. 1 ft = 0.3048 m. 1 s = 10^9 ns.
EXECUTE: $t = \frac{0.3048\ \text{m}}{3.00 \times 10^8\ \text{m/s}} = 1.02 \times 10^{-9}\ \text{s} = 1.02\ \text{ns}$
EVALUATE: In 1.00 s light travels 3.00×10^8 m = 3.00×10^5 km = 186 000 mi.

1.4. IDENTIFY: Convert the units from g to kg and from cm^3 to m^3.
SET UP: 1 kg = 1000 g. 1 m = 100 cm.
EXECUTE: $19.3\ \frac{\text{g}}{\text{cm}^3} \frac{1\ \text{kg}}{1000\ \text{g}} \frac{100\ \text{cm}}{1\ \text{m}}^3 = 19.3 \times 10^3\ \frac{\text{kg}}{\text{m}^3}$
EVALUATE: The ratio that converts cm to m is cubed, because we need to convert cm^3 to m^3.

1.5. IDENTIFY: Convert volume units from in.^{3} to L. SET UP: 1 L = 1000 cm^3. 1 in. = 2.54 cm.
EXECUTE: $1527\ \text{in.}^3 \times 1.2.54\ \text{cm/in.})^3 \times (\text{L}/1000\ \text{cm}^3) = 5.36\ \text{L}$
EVALUATE: The volume is 5.360 cm^3. 1 cm^3 is less than 1 in.^{3}, so the volume in cm^3 is a larger number than the volume in in.^{3}.

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