



3: In printing some book, a length unit of "points" and "picas" are used: 12 points = 1 pica, and 6 picas = 1 inch. What is 2 cm in (a) picas and (b) points?

$$1 \text{ inch} = 2.54 \text{ cm}$$

$$1 \text{ Pica} = 12 \text{ Point}$$

$$1 \text{ inch} = 6 \text{ picas}$$

$$\text{Point} \quad , \quad \text{Picas} \quad \text{is} \quad 1 \text{ cm} \quad \underline{2.54}$$

$$2 \text{ cm} \longrightarrow \frac{2}{2.54} \text{ inch} \longrightarrow \frac{2}{2.54} \times 6 \text{ Picas} \longrightarrow \frac{2}{2.54} \times 6 \times 12 \text{ Point}$$

$$0.787 \text{ inch} \longrightarrow 4.72 \text{ Picas} \longrightarrow 56.69 \text{ Point}$$

4: A plant can grow 0.2 m in 5 days. What was its growth rate in micrometers per second?

$$\text{growth rate} = \frac{0.2 \text{ m}}{5 \text{ days}} = \frac{0.2}{5} \text{ m/day}$$

$$\frac{0.2 \text{ m}}{5 \text{ days}} = \frac{0.2 \times 10^6 \mu\text{m}}{5 \times 24 \times 60 \times 60 \text{ s}} = 0.463 \mu\text{m/s}$$

5: Earth has a mass of  $6 \times 10^{24}$  kg. The average mass of the atoms that make up Earth is 35 u. How many atoms are there in Earth?

$$1u = 1.66054 \times 10^{-27} \text{ kg}$$

$$\frac{\text{كتلة الأرض}}{\text{كتلة الذرة الواحدة}} = \text{عدد الذرات}$$

$$\text{Mass of Earth} = 6 \times 10^{24} \text{ kg}$$

$$\text{Mass of atom} = 35u \rightarrow 35 \times 1.66054 \times 10^{-27} = 581.189 \times 10^{-28} \text{ kg}$$

$$\text{Number of atoms} = \frac{6 \times 10^{24}}{581.189 \times 10^{-28}} = 103 \times 10^{48} \text{ atom} = 10.3 \times 10^{49} \text{ atom}$$

6: Assuming that oil has a density of  $0.3 \text{ g/cm}^3$ , find the density of that oil in  $\text{kg/m}^3$ .

$$\frac{0.3 \text{ g}}{1 \text{ cm}^3} \rightarrow \frac{0.3 \times 10^{-3} \text{ kg}}{1 \times 10^{-6} \text{ m}^3}$$

$$\rightarrow 300 \text{ kg/m}^3$$



