

Solutions of Homework for Unit X.
February 7, 2005

$$a) 25^\circ = 25^\circ \frac{\pi \text{ radian}}{180 \text{ degree}} \approx 0.436 \text{ radian}$$

$$c) 500 \frac{\text{cg}}{\text{mm}^3} = 500 \frac{\text{cg}}{\text{mm}^3} \frac{1 \text{ g}}{100 \text{ cg}} \frac{1 \text{ kg}}{1000 \text{ g}} 100^3 \frac{\text{mm}^3}{\text{m}^3} = 5 \cdot 10^{2-2-3+9} \frac{\text{kg}}{\text{m}^3} = 5 \cdot 10^6 \frac{\text{kg}}{\text{m}^3}$$

$$e) \frac{44.5 \text{ lb}}{50 \text{ cm}^2}$$

Let's consider lb as a unit of force here.

$$1 \text{ lb} = 0.453 \text{ kg} \cdot 9.8 \frac{\text{m}}{\text{s}^2} = 4.45 \text{ N}$$

$$1 \text{ cm}^2 = 0.01^2 \text{ m}^2$$

You may simply replace symbolically lb and cm^2 with values in SI units given above

$$\frac{44.5}{50} \frac{4.45 \text{ N}}{0.01 \text{ m}^2} = 39605 \frac{\text{N}}{\text{m}^2} = 39605 \text{ Pa}$$

g)

$$\frac{\text{cm}}{\text{cs}} = \frac{1 \text{ m}}{100 \text{ cm}} \frac{\text{cm}}{100 \text{ cs}} \frac{1 \text{ s}}{100 \text{ cs}}$$

$$J = \text{kg} \frac{\text{m}^2}{\text{s}^2}$$

$$10^{9-2 \cdot 8} \text{kg} \frac{\text{m}^2}{\text{s}^2} \frac{\text{s}^2}{\text{m}^2} = 10^{-7} \text{kg}$$

i)

$$5 \times 10^8 100^{-3} \frac{\text{m}^3}{\text{cm}^3} \text{cm}^3 + 5 \times 10^{11} 1000^3 \frac{\text{m}^3}{\text{km}^3} \text{km}^3 = 5 \times 10^{20} \text{m}^3$$