

Identify errors in this bits of student math, either in terms of communication or correctness. You may assume that the following variables have been defined:

time t and its change Δt

position x and its change Δx

speed v

acceleration a

area A

mass m

energy KE, PE, U, E

mass density ρ

momentum p

1. $KE = mxa$
2. $PE = 13.38 \times \rho v^2$
3. $p = [10 \text{ kg}] \cdot \frac{\Delta x}{3 \text{ s}}$
4. $v = 10 \cdot \Delta x \text{ m/s}$
5. $10 \text{ kg} + 3 \text{ g}$
6. $A = \frac{1}{2} \cdot (3 \times 10^{-2})^2 = 0.00045 \text{ m}^2 = 4.5 \times 10^{-4} \text{ m}^2$
7. $m = 10 \text{ kg} + 3 \text{ g}$
8. $KE = 0.05\pi v^3$
9. $KE = [0.3 \frac{\text{kg}\cdot\text{s}}{\text{m}}] \pi v^3$
10. $KE = \frac{1}{2}mv^2 \text{ J}$
11. $p = 1.2$
12. $3 \text{ kg} = 3 \text{ kg} \cdot \left(\frac{1000 \text{ g}}{1 \text{ kg}}\right) \cdot \left(\frac{1 \text{ mol}}{28 \text{ g}}\right) \cdot \left(\frac{6 \times 10^{23} \text{ molecules}}{1 \text{ mol}}\right) = 6.4 \times 10^{25} \text{ molecules}$
13. $\# \text{ of molecules in box} = 3 \text{ kg} \cdot \left(\frac{1000 \text{ g}}{1 \text{ kg}}\right) \cdot \left(\frac{1 \text{ mol}}{28 \text{ g}}\right) \cdot \left(\frac{6 \times 10^{23} \text{ molecules}}{1 \text{ mol}}\right) = 6.4 \times 10^{25} \text{ molecules}$
14. $3 \text{ kg} \cdot \left(\frac{1000 \text{ g}}{1 \text{ kg}}\right) \cdot \left(\frac{1 \text{ mol}}{28 \text{ g}}\right) \cdot \left(\frac{6 \times 10^{23} \text{ molecules}}{1 \text{ mol}}\right) = 6.4 \times 10^{25} \text{ molecules}$