PRACTICE QUESTIONS

1. Given $mv = Ft$, where m is mass, v is speed, F is force, and t is time, what are the dimensions of each side of the equation? Is the equation dimensionally correct?

2. Given $H = mC\Delta T$, where H is in joules, m in kilograms, and ΔT in kelvin, what are the SI units and dimensions of C?

3. Given $P = kA\Delta T/\ell$, where A is the area, ΔT is difference in temperature, ℓ is length, and k is a constant with SI units of watts per (metre·kelvin), what are the SI units for P (rate of thermal energy flow)?

4. Given $E = a$ ▯ $\sin(bt)$, where E is energy, ▯ is length and t is time:

   (a) What are the dimensions and SI units of b?

   (b) What are the dimensions and SI units of a?

5. Assuming that frequency (v) of a vibrating string depends upon load applied (F), length of the string (l) and mass per unit length (m), determine the values of a, b and c for this relationship

$$v = kl^aF^bm^c$$