

AP Physics Feud Q&A
By Seth Baum
August 4, 2007

Note: A_b means A_b .

Q & A – Equation Round

1. What are the variables in the equation for the resistance of a cylindrical resistor?
 - a. Resistance: R
 - b. Resistivity: ρ
 - c. Length of element: l
 - d. Cross-sectional area of element: A
 - e. Equation: $R = \rho l / A$
2. What are the variables in the equation for the force on an electric current in a magnetic field?
 - a. Magnetic force: F_B
 - b. Magnetic field: B
 - c. Current: I
 - d. Length of wire in the magnetic field: l
 - e. Angle between magnetic field and wire: θ
 - f. Equation: $F_B = B I L \sin(\theta)$
3. What are the variables in the equation for the period of a pendulum?
 - a. Period: T_P
 - b. Length of pendulum: l
 - c. Acceleration due to gravity: g
 - d. Equation: $T_P = 2 \pi \sqrt{l / g}$
4. What are the variables in the equation for the magnetic flux through a surface?
 - a. Magnetic flux: Φ_M
 - b. Magnetic field: B
 - c. Surface area: A
 - d. Angle between surface normal and field propagation direction: θ
 - e. Equation: $\Phi_M = B A \cos(\theta)$
5. What are the variables in the equation for the rate of heat conduction through a material?
 - a. Rate of heat transfer: H
 - b. Thermal conductivity: h
 - c. Cross-sectional area of material: A
 - d. Temperature change: $(\Delta)T$
 - e. Material thickness: L
 - f. Equation: $H = k A (\Delta)T / L$
6. What are the variables in the equation for sinusoidal wave motion?
 - a. Wave amplitude: A
 - b. Wavelength: λ
 - c. Frequency: f or Period: T or angular frequency: ω

- d. Time: t
 - e. Distance: r
 - f. Equation: $A(r,t) = A_{\text{MAX}} \sin(2(\pi) f t - 2(\pi) x / (\text{lambda})) = A_{\text{MAX}} \sin(2(\pi) t / T - 2(\pi) x / (\text{lambda})) = A_{\text{MAX}} \sin((\text{omega}) t - 2(\pi) x / (\text{lambda}))$
7. What are the variables in the equation for?

Q & A – Regular Round

1. What are the different types of thermodynamic processes?
 - a. Adiabatic
 - b. Isochoric
 - c. Isobaric
 - d. Isothermal
2. What are the properties of this image? (Show picture)
 - e. Upright
 - f. Larger/magnified
 - g. Real
3. What are the different types of nuclear radiation and what are they made out of?
 - h. Alpha: 2 protons, 2 neutrons
 - i. Beta: 1 electron
 - j. Gamma: 1 photon
4. What are the different types of energy involved in a problem in which a block is sliding down an incline?
 - k. Kinetic (of block moving)
 - l. Heat (due to friction)
 - m. Gravitational Potential (of block before reaching bottom)
5. Which pairs of resistors are in series with each other? (Show picture)
 - a. A, B
 - b. C, D
 - c. I, H
 - d. G, J
6. When a traffic light switches from red to green, what properties of the emitted light change, and in what direction (increase/decrease)?
 - a. Frequency: Increase
 - b. Wavelength: Decrease
 - c. Photon Energy: Increase
 - d. Period: Decrease