PHYSICS

The velocity of a wave on a string is given by the formula

$$v = \sqrt{\frac{T}{\mu}}$$

where T is the tension in the string and μ is the linear mass density of the string.

Average velocity is a measure of total displacement over total time.

4 laws of themodynamics

Zeroth Law

If system *A* is at thermal equilibrium with system *B*, and *B* is at thermal equilibrium with system *C*, then *A* is at thermal equilibrium with *C*.

First Law

Consider an isolated system—that is, one where heat and energy neither enter nor leave the system. The First Law is just another way of stating the law of conservation of energy. **The Second Law** Perhaps the most intuitive formulation of the Second Law is that heat flows spontaneously from a hotter object to a colder one, but not in the opposite direction.

1Heat flow

2no machine can work at 100% efficiency

3ordered systems are liable to fall into disorder, but disordered systems are not liable to order themselves spontaneously.

4. time moves in the direction of entropy increase.

Third Law

It is impossible to cool a substance to absolute zero.

The equation for the gravitational potential energy of a planet in orbit is $U = -G\frac{Mm}{R}$

Angular momentum l=Iw=mvr

moment of inertia of $I = mr^2$

At very short distances, the strong nuclear force pulls protons and neutrons together with a much stronger force than the repulsion between like charges exercised by the electromagnetic force. Because of the strong nuclear force, a nucleus has a smaller mass than the sum of the masses of the individual protons and neutrons that make it up. This discrepancy, or mass defect, is the amount of matter that is converted into energy when the nucleus is formed, according to Einstein's principle of mass-energy equivalence.

The amplitude of the sound wave is related to how loud the sound is, and this is affected by the medium through which it travels

Convection is a type of motion found in a gas or liquid where there is a temperature difference between the regions

When making a measurement that involves several different quantities, the resulting measurement can only be accurate to the number of significant digits of the quantity that has the smallest number of significant digits.

If the Earth were of perfectly uniform composition, during a descent to the centre of the Earth, gravity would decrease linearly with distance, reaching zero at the centre.

Heat can flow by conduction, convection, or radiation 传导,对流,辐射

angular momentum, $L = mvr$,

A dielectric increases the capacitance

sinusoidal wave 正弦曲线

Tungsten filament is just a fancy way of saying tungsten, which has the chemical symbol W.