

# Physics Final Review

## Module 1

Understand the difference between distance and displacement, speed and velocity, acceleration  
Find instantaneous velocity using a graph (displacement v. time)

## Module 2

Use the five formulas to calculate velocity, acceleration, displacement or time  
Know what free fall is  
Know what terminal velocity is

## Module 3

Add or subtract vectors graphically  
Add x and y vectors  
Calculate the length and angle of the resultant vector

## Module 4

Understand how velocity changes in the x and y direction in parabolic motion  
Analyze the motion of an object in the x direction and the y direction to solve for displacement, velocity, or time

## Module 5

Know Newton's three laws of motion  
Calculate the weight of an object if you are given its mass  
Understand normal force  
Know the difference between static and kinetic friction  
Solve problems that involve sliding objects across a surface where there is friction

## Module 6

Use  $F=ma$  to solve static and dynamic equilibrium problems

## Module 7

Know what centripetal force is  
Know what causes centripetal force  
Solve centripetal force problems

## Module 8

Know the definitions of work and energy  
Understand how PE and KE change  
Use the change in KE or PE of a system to determine the speed of an object

## Module 9

Understand what momentum and impulse are  
Understand when momentum is conserved  
Use conservation of momentum to solve a recoil or motion problem

## Module 10

Know what periodic motion is  
Know what simple harmonic motion is  
Understand the movement of a mass/spring system and a pendulum

### **Module 11**

Understand the difference between transverse and longitudinal waves

Understand the Doppler effect

Understand how changes in amplitude and wavelength affect sound waves and light waves

### **Module 12**

Know the law of reflection

Know what refraction is

Calculate an index of refraction

### **Module 13**

Understand the difference between conduction and induction

Calculate the electrostatic force between two particles

### **Module 14**

Know what a capacitor is, how it works, and what it's used for

### **Module 15**

Find the effective resistance of resistors in series or parallel

Calculate the power of a circuit

### **Module 16**

Know what a dipole is

Know why some things are magnetic and others aren't

### **Nuclear Physics**

Understand the different types of radiation

Understand half-life

### **Fluids**

Use Pascal's Principle to calculate a force exerted by a fluid

Calculate a buoyant force

### **Thermodynamics**

Understand specific heat capacity

Calculate the amount of energy needed to change the phase of water

Know the four processes: isothermal, isochoric, isobaric, adiabatic

Be able to calculate the amount of work done by a cycle

For each module in the book, you should know:

The meanings of the defined words

How to do all the practice problems

It would be helpful if you understand the following review questions:

Module 1 4, 5, 10

Module 2 1, 3, 6, 8, 10

Module 3 9

Module 4 3 – 6

Module 5 1 – 10

Module 6 4, 7

Module 7 1 – 5, 8, 9

Module 8 2 – 10

Module 9 6 – 8

Module 10 1 – 10

Module 11 1 – 10

Module 12 3 – 5, 7, 8

Module 13 3, 6, 8, 10

Module 14 2 – 9

Module 15 1, 5, 7, 8

Module 16 1 – 20