Physics 201 & 202 Past Exam Questions					
Course	**Exam**	**Question #**	**Chapter**	**Section**	**Question**
2009 Fall	1	28	1	1	Walking rapidly, how many city blocks can a person go in 6 hours?
2009 Fall	1	29	1	2	What is the speed of light in m/s (use scientific notation with E)?
2009 Fall	1	6	1	3	A plastic 72 liter bottle of water will have a mass of about _____
2009 Fall	1	18	1	3	A football player has a mass of 85 kg. What is his mass in lbs?
2009 Fall	1	9	1	3	Convert 81 meters to inches: _____
2009 Fall	1	1	1	4	The prefix Tera is 10 to what power?
2009 Fall	1	7	1	5	Correctly use significant digits to compute 43.4 + 5.834671822 _____
2009 Fall	1	8	1	5	Correctly use significant digits to compute 4E3 * 2.83467 _____
2009 Fall	1	12	1	2	A baseball is thrown straight up from ground level at a speed of 64 ft/s. What is the velocity at the highest point (ignore the sign) in ft/s^2?
2009 Fall	1	13	2	2	A baseball is thrown straight up from ground level at a speed of 64 ft/s. How high will the ball go in ft?
2009 Fall	1	14	2	2	A baseball is thrown straight up from ground level at a speed of 64 ft/s. How long will the ball be in the air (both traveling up and down in s)?
2009 Fall	1	15	2	2	A baseball is thrown straight up from ground level at a speed of 64 ft/s. What will be the velocity in ft/s when the ball hits the ground again?
2009 Fall	1	17	2	3	A mass of 12 kg rests on a flat level table and is attached by a massless wire to a mass of 18 kg that hangs over the edge of the table via a pulley. If there is no friction, what is the acceleration of the system in m/s?
2009 Fall	1	19	2	3	A mass of 9.9 kg is initially, at time t = 0, resting on an incline plane which has an angle of 37 degrees with the horizontal (x) axis. The two objects have no friction. What is the acceleration of the mass?
2009 Fall	1	20	2	3	A mass of 9.9 kg is initially, at time t = 0, resting on an incline plane which has an angle of 37 degrees with the horizontal (x) axis. The two objects have no friction. What force, in Newtons, does the mass feel pulling it down the incline plane?
2009 Fall	1	21	2	3	A mass of 9.9 kg is initially, at time t = 0, resting on an incline plane which has an angle of 37 degrees with the horizontal (x) axis. If there is a coefficient of dynamic friction of 0.23 then what is the frictional force?
2009 Fall	1	3	3	1	Vector A = (2, 1, 0) and vector B = (1, 3, 1). What is the length of A?
2009 Fall	1	4	3	1	Vector A = (2, 1, 0) and vector B = (1, 3, 1). What is the scalar product of A and B?

2009 Fall	1	5	3	1	Vector A = (2, 1, 0) and vector B = (1, 3, 1). What is the angle between A and B in degrees?
2009 Fall	1	22	3	2	A golf ball is hit at a speed of 85 m/s at an angle of 45 degrees with respect to the ground. How high will it go?
2009 Fall	1	23	3	2	A golf ball is hit at a speed of 85 m/s at an angle of 45 degrees with respect to the ground. How long will the ball in the last problem take to reach the ground after being hit?
2009 Fall	1	24	3	2	A golf ball is hit at a speed of 85 m/s at an angle of 45 degrees with respect to the ground. How far will the ball go in the horizontal direction?
2009 Fall	1	10	3	3	If you can swim at 8 ft/s and a river is moving at 4 ft/s then what is the angle in degrees (relative to a perpendicular to the river) at which you must swim in order to go straight across the river?
2009 Fall	1	11	3	3	If you can swim at 8 ft/s and a river is moving at 4 ft/s then what is your resulting speed across the river if you move straight across (compensating for the current)?
2009 Fall	1	2	4	1	When one particle pushes on a second, then the second pushes back on the first with an equal and opposite force. Which of Newton's laws is this (1,2,3,4,5,…)?
2009 Fall	1	16	4	1	If a force of 234 Newtons is applied to a mass of 3 kg for a time of 12.5 s, then the acceleration in m/s^2 is _____
2009 Fall	1	25	4	1	An Atwood's machine has weights at rest at time t=0 of 81 kg and 21 kg. What is the acceleration of the 8 kg weight?
2009 Fall	1	26	4	1	An Atwood's machine has weights at rest at time t=0 of 81 kg and 21 kg. How far will the weights move in the first 5 seconds after being released from rest?
2009 Fall	1	27	4	1	An Atwood's machine has weights at rest at time t=0 of 81 kg and 21 kg. What is the tension in the rope?
2009 Fall	2	25	5	2	A car goes around a curve at 50 m/s and the curve has a radius of 25 m, what is the centripetal acceleration?
2009 Fall	2	21	5	3	If you swing a bucket of water over your head (keeping the water barely in the bucket with centripetal force) then does the period of revolution of the bucket depend upon the amount of water in the bucket?
2009 Fall	2	22	5	3	What is the acceleration of the water in the bucket at the top of the swing?
2009 Fall	2	23	5	3	What is the acceleration of the water in the bucket at the bottom of the swing?

2009 Fall	2	24	5	3	Just roughly try to remember from class for the last problem, what the period of such revolution is that we calculated (or you can recalculate it). Round your answer off to the nearest second for the time needed for a complete revolution.
2009 Fall	2	1	6	1	A force of 3 Nt is applied to a mass of 12 kg at an angle of 40 degrees with the direction of motion. The object is pushed a total distance of 18 m. How much work is done?
2009 Fall	2	6	6	1	What is the approximate energy contained in a chemical fuel in units of Joules/kg (write as rounded to a power of 10 in scientific notation: 1E??)?
2009 Fall	2	7	6	1	What is the average solar power in the US in Watts per sq meter (same as SC)?
2009 Fall	2	2	6	2	A football player of mass 120 kg is running at 8 m/s.What is his kinetic energy?
2009 Fall	2	3	6	2	A football player of mass 120 kg climbs a latter to a diving platform that is 38 m high, in a time of 8 sec, then what work does he do?
2009 Fall	2	4	6	2	A football player of mass 120 kg climbs a latter to a diving platform that is 38 m high, in a time of 8 sec,what is his final potential energy?
2009 Fall	2	8	6	2	How much energy in Joules is 18 KWHR?
2009 Fall	2	11	6	2	A spring with a spring constant k = 5 is stretched by 7 meters. How much energy was used?
2009 Fall	2	5	6	3	A football player of mass 120 kg climbs a latter to a diving platform that is 38 m high, in a time of 8 sec, How much power was required?
2009 Fall	2	9	6	3	If a person works for 8 hours at a laboring job, how much energy do they expend?
2009 Fall	2	10	6	3	What would the monthly cost be for a home to use 2,000 KWHR?
2009 Fall	2	12	6	3	Bob only eats Wendy's hamburgers which are 300 Calories each and cost $2.50 each. What does it cost him to supply his daily energy metabolism needs?
2009 Fall	2	15	7	2	A football player of mass 90 kg is running at 10 m/s and catches a football of mass ½ kg that is moving at 40 m/s in the same direction. If the player is on ice (no friction) then what is his final speed after catching the ball?
2009 Fall	2	16	7	2	How much energy was lost?
2009 Fall	2	18	7	2	Was the collision of the football player and the ball elastic, partly elastic, or inelastic?
2009 Fall	2	19	7	4	A board is 12 ft long and has a mass of 40 lbs. It has a rock attached to it of mass 20 lbs at a distance of 4 ft from the left end and another rock of mass 30 lbs at 8 ft from the left end. How far is the center of mass from the left end?
2009 Fall	2	14	7	5	A baseball of mass 0.4 kg arrives at the plate at a speed of 60 m/s and is hit by the bat going in the other direction at the same speed. What is the impulse?

2009 Fall	3	2	8	1	Consider a bicycle wheel of mass 12 kg (all on the rim) and radius 3 m that is rolling along at a velocity of 8 m/s. Brakes are applied at the rim in order to stop the wheel in 5 seconds. What is its initial angular velocity?
2009 Fall	3	4	8	1	Consider a bicycle wheel of mass 12 kg (all on the rim) and radius 3 m that is rolling along at a velocity of 8 m/s. Brakes are applied at the rim in order to stop the wheel in 5 seconds. What is the angular acceleration?
2009 Fall	3	8	8	1	Consider a bicycle wheel of mass 12 kg (all on the rim) and radius 3 m that is rolling along at a velocity of 8 m/s. Brakes are applied at the rim in order to stop the wheel in 5 seconds. What was the rps (revolutions per second) of the wheel initially?
2009 Fall	3	11	8	1	What is the angular velocity of the earth on its axis?
2009 Fall	2	26	8	2	A bicycle wheel has a radius of 0.8 m. It started from rest and has had uniform acceleration over a period of 4 seconds until it is now going at 20 m/s. What is the final angular velocity?
2009 Fall	2	27	8	2	A bicycle wheel has a radius of 0.8 m. It started from rest and has had uniform acceleration over a period of 4 seconds until it is now going at 20 m/s. What was the initial angular velocity?
2009 Fall	2	28	8	2	A bicycle wheel has a radius of 0.8 m. It started from rest and has had uniform acceleration over a period of 4 seconds until it is now going at 20 m/s. What was the angular acceleration?
2009 Fall	2	29	8	2	A bicycle wheel has a radius of 0.8 m. It started from rest and has had uniform acceleration over a period of 4 seconds until it is now going at 20 m/s. How far did the wheel go in radians?
2009 Fall	2	30	8	3	A bicycle wheel has a radius of 0.8 m.It started from rest and has had uniform acceleration over a period of 4 seconds until it is now going at 20 m/s. What was the final centripetal acceleration at the edge of wheel?
2009 Fall	3	5	9	1	Consider a bicycle wheel of mass 12 kg (all on the rim) and radius 3 m that is rolling along at a velocity of 8 m/s. Brakes are applied at the rim in order to stop the wheel in 5 seconds. What torque is applied to the wheel?
2009 Fall	3	9	9	1	Consider a bicycle wheel of mass 12 kg (all on the rim) and radius 3 m that is rolling along at a velocity of 8 m/s. Brakes are applied at the rim in order to stop the wheel in 5 seconds. As seen from the person riding the bicycle, what is the direction of the torque used to stop the bicycle? (left, right, up, down, forward, backward)?

2009 Fall	3	12	9	1	What is the direction of torque needed to turn OFF a water faucet on the side of your house at face level? (left, right, up, down, in (to the wall) or out (of the wall)
2009 Fall	3	13	9	2	If a bridge with mass 400,000 kg is 50 m long and a truck of mass 20,000 kg is 10 m from one end then what is the force (use Newtons and remember to use g to get force) required to hold up that end of the bridge closest to the truck?
2009 Fall	3	1	9	3	Consider a bicycle wheel of mass 12 kg (all on the rim) and radius 3 m that is rolling along at a velocity of 8 m/s. Brakes are applied at the rim in order to stop the wheel in 5 seconds. What is its moment of inertia?
2009 Fall	3	6	9	4	Consider a bicycle wheel of mass 12 kg (all on the rim) and radius 3 m that is rolling along at a velocity of 8 m/s. Brakes are applied at the rim in order to stop the wheel in 5 seconds. What was its initial rotational kinetic energy?
2009 Fall	3	7	9	4	Consider a bicycle wheel of mass 12 kg (all on the rim) and radius 3 m that is rolling along at a velocity of 8 m/s. Brakes are applied at the rim in order to stop the wheel in 5 seconds. What was its initial translational kinetic energy?
2009 Fall	3	3	9	5	Consider a bicycle wheel of mass 12 kg (all on the rim) and radius 3 m that is rolling along at a velocity of 8 m/s. Brakes are applied at the rim in order to stop the wheel in 5 seconds. What is its initial angular momentum?
2009 Fall	3	10	9	5	A (massless) person on a rotating platform is spinning at 4 rev per sec with a 5 kg mass in each hand at a distance of 0.8 m from the center or axis. If these masses are pulled in to a distance of 0.2 m from the center, what is the new angular velocity in rev per sec? (note the units of rps both before and after)!
2009 Fall	4	1	11	1	A spring has a spring constant of 4.5 and is stretched by 5 meters. What force is required?
2009 Fall	4	2	11	1	How much energy is stored in the stretched spring?
2009 Fall	4	4	11	2	If a force of 4E6 Nt is applied to the end of a brass rod of cross sectional area of 0.3 m2, and 20 m long, then how much will it stretch?
2009 Fall	4	5	11	2	Bulk modulus allows one to calculate the change in _____ if a given solid has a pressure increase on all surfaces assuming one knows the original volume.
2009 Fall	4	3	12	1	If a mass of 3 kg is on the end of the stretched spring, then what is the angular frequency of the oscillation?
2009 Fall	4	6	12	1	Assume that an oscillating system has an frequency of 3. Then what is the angular frequency?
2009 Fall	4	7	12	1	Assume that an oscillating system has an frequency of 3 then what is the period?

2009 Fall	4	8	12	1	Is it possible to compute the amplitude from this data? _____ Y/N
2009 Fall	4	10	12	1	A harmonic oscillator is always what function of wo t
2009 Fall	4	12	12	1	Assume you have a wave of the form y = 5 cos(3t-7x+pi). What is the amplitude?
2009 Fall	4	13	12	1	Assume you have a wave of the form y = 5 cos(3t-7x+pi), what is the angular frequency?
2009 Fall	4	14	12	1	Assume you have a wave of the form y = 5 cos(3t-7x+pi), what is the wave number?
2009 Fall	4	15	12	1	Assume you have a wave of the form y = 5 cos(3t-7x+pi), what is the wave length?
2009 Fall	4	16	12	1	Assume you have a wave of the form y = 5 cos(3t-7x+pi), what is the frequency?
2009 Fall	4	17	12	1	Assume you have a wave of the form y = 5 cos(3t-7x+pi), what is the period?
2009 Fall	4	11	12	3	A damped harmonic oscillator always occurs when there is friction and this gives a multiplier term that is what function of the time?
2009 Fall	4	9	12	5	If we apply an oscillating force to this system, then what angular frequency should the applied force have in order to get the largest resonance effect?
2009 Fall	4	22	13	1	If the velocity changes randomly and erratically in both magnitude and direction, then what is the type of fluid flow called?
2009 Fall	4	23	13	1	Is an ideal fluid viscous? _____ Y/N
2009 Fall	4	28	13	2	What is the approximate density of wood?
2009 Fall	4	26	13	3	What is normal atmospheric pressure in units of Pa?
2009 Fall	4	27	13	3	What is the pressure when you are 40 m under water in units of atmospheres?
2009 Fall	4	24	13	4	If water is flowing in a hose pipe at a velocity of 6 m/s at a radius of 2 m, then what is the velocity when the radius is 4 m?
2009 Fall	4	25	13	4	Bernoulli/s equation is equivalent to the conservation of _____ ?
2009 Fall	4	18	14	1	What is the wave length in meters of a 400 Hz sound wave?
2009 Fall	4	19	14	1	What is the wave length of an electromagnetic wave at 103 FM?
2009 Fall	4	20	14	2	What is the standard frequency in Hz for western music?
2009 Fall	4	21	14	2	What is the lowest frequency of human hearing in Hz?
2009 Fall	4	29	14	2	If a sound has an intensity of 1E-7 W/m2 then how many decibels is that?
2009 Fall	4	30	14	2	What sound intensity is the softest that can be heard in units of W/m2 (sometimes called the threshold of hearing level)?
2009 Fall	4	31	14	5	The human body responds with what mathematical function of the physical stimulation?
2009 Fall	4	32	15	5	What is the frequency of a sound that is 3 octaves above the frequency 40 Hz?
2009 Fall	4	33	15	5	What is the frequency of a sound that is a fifth above the frequency of 40 Hz?
2009 Fall	3	19	16	1	What is the average temperature of the earth for approximate calculation in oK?

2009 Fall	3	20	16	1	What is the energy content of a kitchen match in BTU?
2009 Fall	3	30	16	1	Convert a temperature of 81 C to F?
2009 Fall	3		16	2	How much does the temperature of 8 kg of water increase (in oC) if 16 Caloreis of heat is applied?
2009 Fall	3	31	16	3	How much does the temperature of 8 kg of ice increase (in oC) if it is melting when 16 Calories of heat are added?
2009 Fall	3	14	17	1	A standard wall of a house measures 8 ft high by 20 ft long and has no insulation in it and no windows. What is its R factor?
2009 Fall	3	15	17	1	If it is 30 oF outside and 70 oF inside then what is the rate of heat flow in BTU per hour through the wall?
2009 Fall	3	16	17	1	What would it be if the wall were made of a single pane glass window?
2009 Fall	3	17	17	1	What would it be if the wall were insulated in the normal way?
2009 Fall	3	18	17	1	What is the R value for wall insulation?
2009 Fall	3	21	17	2	How much heat (ie power in watts) is radiated from a 12 sq m solid black piece of asphalt that is at 340 oK?
2009 Fall	3	23	18	1	What is Avogadro's constant?
2009 Fall	3	26	18	1	How many moles are there in 500 ml of water?
2009 Fall	3	27	18	1	What element is the standard for the atomic mass unit? (give the atomic weight also)
2009 Fall	3	28	18	1	What fraction of this atom (in the last problem) is the amu?
2009 Fall	3	22	18	2	Compute the Boltzman constant?
2009 Fall	3	24	18	2	The ideal gas law is P ? = n R T where the ? is what symbol_____
2009 Fall	3	25	18	2	Using the ideal gas law, if the temperature is held constant and the pressure is changed from 1 atmosphere to 3 atmospheres, then what is the new volume if the old volume is 6 cubic meters?
2009 Fall	3	29	18	2	The average random kinetic energy of an ideal gas is proportional to?
2010 Spring	1	2	20	1	What is the direction of the force in the last problem? Attractive or Repulsive?
2010 Spring	1	11	20	1	Who was responsible for the discovery of the force law for electrical charges? (last name of man for whom the equation was named)
2010 Spring	1	1	20	2	A +4 C charge (at the origin (0,0)) is 7 m from an -4C charge (at the point (7,0)). What is the magnitude of the force between them?
2010 Spring	1	16	20	2	There are 18 Coulombs on each 2 m section of a wire. What is the charge per unit length?

2010 Spring	1	3	21	2	What is the electric field magnitude at the point (4,0) due to a +3 C charge at the origin (0,0)?
2010 Spring	1	9	21	2	A +4 C charge (at the origin (0,0)) is 7 m from an -4C charge (at the point (7,0)). What is the direction of the electric field half way between the two charges (at the point (3.5, 0))? (-x, +x, -y, +y)
2010 Spring	1	4	21	3	What is the direction of the electric field in the last problem (-x, +x, -y, +y)? (note –x = left)
2010 Spring	1	22	21	3	What is the dipole moment of the two charges in problem #1?
2010 Spring	1	23	21	4	What is the magnitude of the torque that is felt by this dipole if an electric field 12 N/C is placed perpendicular to the pair and in the +Y direction.
2010 Spring	1	24	21	4	What is the potential energy of this dipole in this electric field?
2010 Spring	1	12	22	2	An infinite plane has a surface charge of -5C/m2. What is the magnitude of the electric field 3 meters from the plane?
2010 Spring	1	13	22	2	What is the direction of the electric field in the last problem (toward or away) from the plane?
2010 Spring	1	14	22	2	Now consider two planes separated by 10 m, one with a charge of -5C/m2 and the other with a charge of +5C/m2. What is the magnitude of the electric field between the two planes at a point 2 m from the negative plane?
2010 Spring	1	15	22	2	What is the magnitude of the electric field in the last problem at a point exterior to the two planes?
2010 Spring	1	17	22	2	In the last problem, what is the magnitude of the electric field 6 m from the wire?
2010 Spring	1	8	23	1	Is it possible for electric field lines to cross? (yes , no)
2010 Spring	1	6	23	2	What is the magnitude of the potential energy of the pair of charges in problem #1?
2010 Spring	1	7	23	2	What is the sign of the potential energy that you computed in problem #6?
2010 Spring	1	5	23	3	What is the magnitude of the electric potential at the point (4,0) due to the +3 charge in problem #3?
2010 Spring	1	10	23	3	A +4 C charge (at the origin (0,0)) is 7 m from an -4C charge (at the point (7,0)). What is the magnitude of the potential at this point (3.5,0)? (i.e. half way between the charges in problem #1)
2010 Spring	1	18	23	3	Consider three charges, +9, +36, and -2 that are at the vertices of an equilateral triangle with each side of length 3 m. What is the magnitude of the potential energy of the system?
2010 Spring	1	19	23	3	Is the voltage at the center of this triangle (in the last problem) positive or negative?

2010 Spring	1	20	23	3	What is the voltage of a common AA, AAA, C, or D battery?
2010 Spring	1	21	23	3	How much work is required to move a charge of 4 C from the negative terminal of a car battery to the positive terminal?
2010 Spring	2	1	24	1	A capacitor that is charged with 7 Coulombs has a voltage of 13 volts. What is the capacitance?
2010 Spring	2	3	24	1	What are the units of Capacitance?
2010 Spring	2	2	24	2	How much energy is stored in this capacitor?
2010 Spring	2	4	24	2	What is the total capacitance of a system of capacitors as shown where C1 = 3 is in series with C2= 7 and in series with the system that is a pair of capacitors C3= 5 and C4= 11 which are in parallel?
2010 Spring	2	6	24	3	If a parallel plate capacitor of C = 5 and a voltage of V = 2 has a dielectric inserted that has a dielectric constant of $\kappa = 3.2$, then what is the new capacitance?
2010 Spring	2	5	24	4	What is the capacitance of a parallel plate capacitor where the plates have an area 5 sq meters and are separated by a distance of 2 millimeters?
2010 Spring	2	7	25	1	If 9 Coulombs pass a point in 7 seconds, what is the electric current?
2010 Spring	2	8	25	1	What are the units of electric current?
2010 Spring	2	9	25	2	If a resistor has a current of 28 when a car battery is applied to the ends then what is the resistance of the resistor?
2010 Spring	2	10	25	2	What are the units of resistance?
2010 Spring	2	11	25	2	What is the total resistance of a system of resistors as shown where R1 = 3 is in series with R2= 7 and in series with the system that is a pair of resistors R3= 5 and R4= 11 which are in parallel?
2010 Spring	2	12	25	3	If a resistor is 12 m long and 4E-4 square meters in cross sectional area which is made of silver (resistivity of 1.6E-8) then what is its resistance.
2010 Spring	2	13	25	3	If the temperature increases on this resistor (last problem) then does the resistance go up or down?
2010 Spring	2	14	25	3	What is the conductivity of silver?
2010 Spring	2	15	25	3	If we apply 100 volts to a 60 watt bulb, then what current will flow in it?
2010 Spring	2	16	26	1	A normal relay for household 120 V circuit is about how many amps?
2010 Spring	2	17	26	1	Kirchhoff's first law states that the sum of the _____ into a node or point is zero.
2010 Spring	2	18	26	1	Kirchhoff's second law states that the sum of the _____ around any closed electrical loop is equal to zero.

2010 Spring	2	19	26	2	A capacitor of 12 Farads that is charged to a level of 44 Volts is attached to a resistor of 13 Ohms. What is the time constant of this circuit?
2010 Spring	2	20	26	2	What will the charge on the capacitor be after 2 units of the time constant?
2010 Spring	2	21	26	2	Identify the symbol that the instructor draws for a resistor:
2010 Spring	2	22	26	2	Identify the symbol that the instructor draws for the capacitor?
2010 Spring	2	23	26	2	Identify the symbol that the instructor draws for the applied voltage of direct current?
2010 Spring	2	24	26	2	Identify the symbol that the instructor draws for the applied voltage of alternating current?
2010 Spring	2	25	26	2	Identify the symbol that the instructor draws the ground connection?
2010 Spring	4	23	26	2	What is the angle to the first destructive (black) band?
2010 Spring	2	33	27	1	What are the units of the magnetic field?
2010 Spring	2	34	27	1	This SI unit is very large so what unit name is used for a more common level of magnetic field such that of the earth (give the other magnetic field unit name)?
2010 Spring	2	28	27	2	A charge of 12 coulombs that is traveling at 3 m/s at an angle of 14 degrees (above the x axis) to a magnetic field of 55 (in the +x direction) will experience what force?
2010 Spring	2	29	27	2	Using the diagram drawn by the instructor, what is the direction of this force?
2010 Spring	2	30	27	3	A square piece of wire measures 3m on each side and carries a current of 18 amps. What is the magnetic moment.
2010 Spring	2	31	27	3	A square piece of wire measures 3m on each side and carries a current of 18 amps and lies in the xy plane. What is the direction of the magnetic moment?
2010 Spring	2	32	27	3	If a magnetic field (of magnitude 4) is directed in the +Z direction perpendicular to a magnetic dipole (of magnitude 7) that points in the -Y direction, then what is the torque on the dipole?
2010 Spring	2	26	27	4	Gauss's law for magnetic fields states that the total flux through any closed surface is _____.
2010 Spring	2	27	27	4	Gauss's law for magnetic fields is equivalent to stating that there are no magnetic _____.
2010 Spring	3	1	28	1	Compute the magnetic field due to a small current segment of length 1/10 m and carrying 4 Amps of current with the current direction and wire segment aimed toward your face (+ Z direction). What is the current magnitude a distance of 9 m to your right perpendicular to the segment (i.e. the +x direction)?
2010 Spring	3	2	28	1	What is the direction of the magnetic field at that point (+ x, -x, +y, -y, +z, -z)?

2010 Spring	3	3	28	1	What would the magnitude be at the same distance but at 40 degrees away from the +x axis and toward your face?
2010 Spring	3	17	28	1	What is the numerical value of μ_o ?
2010 Spring	3	18	28	1	What is the name for μ_o ? _____ of free space.
2010 Spring	3	4	28	2	Electrons are moving upward in an infinite vertical straight wire that is in front of you and is 12 meters from your nose and the magnitude of the current is 7 amps. What is the strength of the field at your nose?
2010 Spring	3	5	28	2	What is the direction at your nose?
2010 Spring	3	6	28	2	A solenoid has 33 turns and carries a current of 5 amps. What is the magnetic field interior to the solenoid?
2010 Spring	3	7	28	4	Which law would allow you to solve a problem to determine the magnetic field due to an infinite wire with current flowing. (Gauss' Electric, Gauss' Magnetic, Ampere's , Faraday's, Lorentz Force Equation, Newtons 2^{nd} Law …) _____
2010 Spring	3	8	28	6	Which of the laws(Gauss' Electric, Gauss' Magnetic, Ampere's , Faraday's, Lorentz Force Equation, Newtons 2nd Law …) were modified by Maxwell in order to specify Maxwell's equations?
2010 Spring	3	9	29	1	Imagine a rectangular loop of wire that measures 4 m by 6 m and which carries a current of 9 amps. Now imagine that the flux in the loop goes from 14 to 0 as the current goes from 9 to zero in a time of 5 seconds. What is the resulting induced voltage from the changing magnetic field?
2010 Spring	3	10	30	1	What is the inductance of the coil?
2010 Spring	3	11	30	1	What are the units of the inductance?
2010 Spring	3	16	30	3	If a transformer has 4 amps going through one side of a transformer that has 13 turns, then how many turns would be needed on the other side to give 220 volts?
2010 Spring	3	12	31	1	In the second order differential equation for an inductor, resistor, capacitor, and battery in series then what is the coefficient of d^2q/dt^2 ?
2010 Spring	3	13	31	1	In the second order differential equation for an inductor, resistor, capacitor, and battery in series then what is the coefficient of dq/dt?
2010 Spring	3	14	31	1	In the second order differential equation for an inductor, resistor, capacitor, and battery in series then what is the coefficient of q ?

2010 Spring	3	15	31	2	Which of these terms (symbols), if they had a value of 0, would always result in oscillatory motion?
2010 Spring	3	20	32	3	Which of Maxwell's equations tell us that there are no magnetic monopoles?
2010 Spring	3	19	32	4	Which of the Maxwells equations give the possibility of generating electrical power from mechanical power?
2010 Spring	4	10	33	1	Which direction determines the direction of polarization: the velocity c or the electric field direction E?
2010 Spring	4	3	33	2	If an EM wave, for the Electric field is E = 14 cos(5 x + 7 t + Pi) then: What is the angular frequency?
2010 Spring	4	4	33	2	If an EM wave, for the Electric field is E = 14 cos(5 x + 7 t + Pi) then: What is the wave length?
2010 Spring	4	5	33	2	If an EM wave, for the Electric field is E = 14 cos(5 x + 7 t + Pi) then: What is the wave number?
2010 Spring	4	6	33	2	If an EM wave, for the Electric field is E = 14 cos(5 x + 7 t + Pi) then: What is the period?
2010 Spring	4	7	33	2	If an EM wave, for the Electric field is E = 14 cos(5 x + 7 t + Pi) then: What is the frequency?
2010 Spring	4	8	33	2	If an EM wave, for the Electric field is E = 14 cos(5 x + 7 t + Pi) then: What is the ratio of the energy density contained in the magnetic field to that in the electric field?
2010 Spring	4	9	33	2	If an EM wave, for the Electric field is E = 14 cos(5 x + 7 t + Pi) then: What is the phase of the wave?
2010 Spring	4	1	33	3	Maxwell's equations in a vacuum require that the electric field be what multiple of the magnetic field?
2010 Spring	4	2	33	3	Maxwell's equations in a vacuum also require a relationship that determines that the product of $\varepsilon_o\mu_o$ is what power of the velocity of light?
2010 Spring	4	11	34	2	If a mirror has a radius of curvature of 7 m then what is its focal length?
2010 Spring	4	12	34	2	If a convex mirror (like a spherical reflecting ball in a garden) with a focal length of 9 feet, is 47 ft from an object, then the image will be what distance from the mirror?
2010 Spring	4	13	34	2	Will the image be real or virtual?
2010 Spring	4	14	34	2	Will the image be upright or inverted?
2010 Spring	4	17	35	1	What would the critical angle of crown glass be?

2010 Spring	4	15	35	4	If a laser beam moves from air into crown glass (index of refraction of 1.523) at an angle of 37 degrees from the interface surface perpendicular, then what will be the angle of the beam after entering the glass?
2010 Spring	4	16	35	4	Whose law allows one to solve for the angle of refraction when light moves from one media to another?
2010 Spring	4	18	35	4	If a converging lense has a focal length of 7 meters, and an object is 32 m from the lense, then at what distance from the lense will the image be formed?
2010 Spring	4	19	35	4	A converging lense has a focal length of 7 meters, and an object is 32 m from the lense, will the image be real or virtual?
2010 Spring	4	20	35	4	A converging lense has a focal length of 7 meters, and an object is 32 m from the lense will it be upright or inverted?
2010 Spring	4	21	35	4	A converging lense has a focal length of 7 meters, and an object is 32 m from the lense. What will the magnification factor be?
2010 Spring	4	22	36	2	In Young's double slit experiment, a wave of wave length 4E-2 m hits two holes that are 3E-2 apart. What is the angle to the first constructive maxima?
2010 Spring	4	24	36	3	With waves such as light with say a frequency of 100 Mega Hz, one can distinguish only between two points that are what distance apart?
2010 Spring	4	25	37	3	An object is 18 m long when at rest. How long is it when photographed as it passes the camera at 0.9955 the speed of light?
2010 Spring	4	26	37	3	Whose name is given to the law that gives the contraction of length in relativity?
2010 Spring	4	27	37	3	A person moving at this same speed relative to you and living for 100 years in her own frame of reference would effectively live how long to the observe who saw them pass by?
2010 Spring	4	28	37	3	The law is that describes the difference of time intervals in a moving frame is called time ___?_____.
2010 Spring	4	33	37	3	Could you cross the milky way galaxy (100,000 light years across) in your lifetime by going slower than the speed of light if you only live for 100 years? Yes or No?
2010 Spring	4	29	37	4	If a 3 kg mass of matter meets a 3 kg mass of antimatter, they will totally annihilate into pure energy – How much in joules?
2010 Spring	4	30	37	4	In the relativistic equation for energy, momentum and mass: E^2/c^2 - __?__ = $m^2 c^2$, what is the ? term?
2010 Spring	4	31	37	4	Antimatter corresponds to what kind of substance?
2010 Spring	4	32	37	4	Has antigravity yet been discovered?

2010 Spring	4	34	37	5	Space and time are related by a transformation that uses what kind of sin and cos functions?
2010 Spring	4	35	39	2	Plank's constant has the value of 6.6 E-34 What is the energy of one photon of electromagnetic radiation from the radio station at 104.7 FM?
2010 Spring	4	36	39	2	Who (last name) explained cavity radiation after Plank proposed his oscillator solution?
2009 Fall	2	13	Math		Expand e 0.5 using the first four terms and do not round your answer?