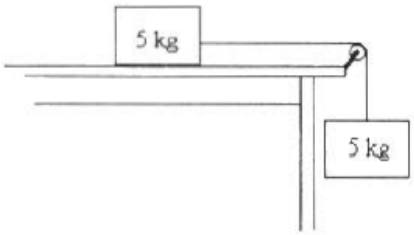
Current Score: 0/15

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total
Points	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/15

1. 0/1 points POE1 2000.MC.17. [1064450]

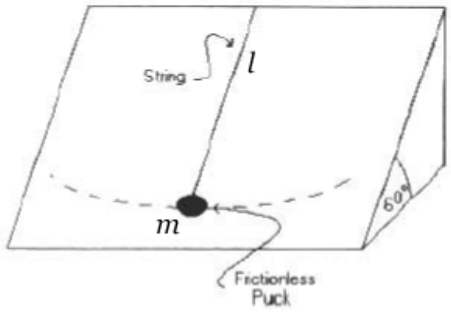
Two 5 kg masses are attached to opposite ends of a long massless cord which passes tautly over a massless frictionless pulley. The upper mass is initially held at rest on a table 50 cm from the pulley. The coefficient of kinetic friction between this mass and the table is 0.2. When the system is released, its resulting acceleration is closest to which of the following?



- 9.8 m/s^2
- 7.8 m/s^2
- 4.9 m/s^2
- 3.9 m/s^2
- 1.9 m/s^2

2. 0/1 points POE1 2000.MC.07. [1070264]

A frictionless air puck of mass m is placed on a plane surface inclined at an angle of 60° with respect to the horizontal. A string of length l is attached to the puck at one end and the upper edge of the inclined plane at the other to constrain the movement of the puck. If the puck was set into a back and forth pendulum motion as indicated by the dotted line, what would be the period of motion?



- $T = 2\pi\sqrt{\frac{l}{g}}$
- $T = 2\pi(\tan 60°)\sqrt{\frac{l}{g}}$
- $T = 2\pi\sqrt{\frac{l}{g(\sin 60°)}}$
- $T = 2\pi\sqrt{\frac{l(\sin 60°)}{g}}$
- None of the above

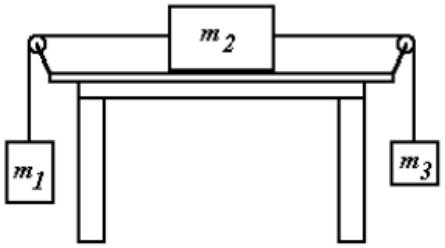
3. 0/1 points POE1 1998.MC.28. [1066378]

An ion with a charge q, mass m, and speed v enters a magnetic field B and is deflected into a path with a radius of curvature R. If an ion with charge q, mass $2m$, and speed $2v$ enters the same magnetic field, what will be the radius of curvature of the path it will be deflected into?

- 4 R
- 2 R
- R
- (1/2) R
- (1/4) R

4. 0/1 points POE1 1999.MC.12. [1064644]

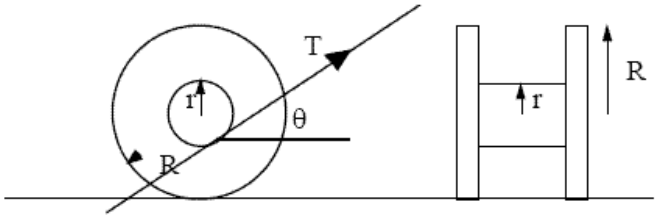
Given the three masses as shown in the diagram below, if the coefficient of kinetic friction between the large mass (m_2) and the table is μ, what would be the upward acceleration of the small mass (m_3)? The mass and friction of the cords and pulleys are small enough to produce a negligible effect on the system.



- $\frac{m_1 g}{m_1 + m_2 + m_3}$
- $\frac{g(m_1 + m_2\mu)}{m_1 + m_2 + m_3}$
- $\frac{g\mu(m_1 + m_2 + m_3)}{m_1 - m_2 - m_3}$
- $\frac{g\mu(m_1 - m_2 - m_3)}{m_1 + m_2 + m_3}$
- $\frac{g(m_1 - m_2\mu - m_3)}{m_1 + m_2 + m_3}$

5. 0/1 points POE1 1998.MC.16. [1066389]

A length of rope is wrapped around a spool of weight W with inner radius r and outer radius R as shown in the diagram below. The rope is pulled with a tension T at an angle θ. Which of the following conditions must be satisfied for the spool to slide uniformly without rolling?



- [x] $\cos\theta = r/R$
- [ ] $\sin\theta = r/R$
- [ ] $T = W$
- [ ] $T = W\sin\theta$
- [ ] $T = W\cos\theta$

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6. 0/1 points POE1 1998.MC.04. [1066373]

A child tosses a ball directly upward. Its total time in the air is T. Its maximum height is H. What is its height after it has been in the air a time $T/4$? Neglect air resistance.

- [ ] 1/4 H
- [ ] 1/3 H
- [ ] 1/2 H
- [ ] 2/3 H
- [x] 3/4 H

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7. 0/1 points POE1 1998.MC.14. [1066364]

Consider the motion of two blocks along a frictionless level track. Block #1 (mass m_1) is initially moving with speed v_0. It collides with and sticks to an initially stationary block (#2) of mass $m_2 = 9\ m_1$. What fraction of the initial kinetic energy of the system is converted to other forms (heat, sound, ...) as a result of the collision?

- [ ] 1 %
- [ ] 10 %
- [ ] 50 %
- [x] 90 %
- [ ] 99 %

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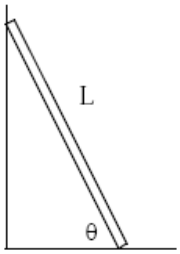
8. 0/1 points POE1 1998.MC.03. [1066372]

In a rescue attempt, a hovering helicopter drops a life preserver to a swimmer being swept downstream by a river current of constant velocity v. The helicopter is at a height of 9.8 m. The swimmer is 6.0 m upstream from a point directly under the helicopter when the life preserver is released. It lands 2.0 m in front of the swimmer. How fast is the current flowing? Neglect air resistance.

- 13.7 m/s
- 9.8 m/s
- 6.3 m/s
- 2.8 m/s
- 2.4 m/s

9. 0/1 points POE1 1997.MC.11. [1074710]

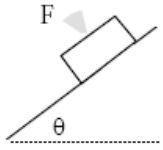
A uniform ladder of length L rest against a smooth frictionless wall. The floor is rough and the coefficient of static friction between the floor and ladder is μ. When the ladder is positioned at angle θ, as shown in the accompanying diagram (see below), it is just about to slip. What is θ?



- $\sin\theta = \frac{1}{\mu}$
- $\cos\theta = \mu$
- $\tan\theta = \frac{1}{2\mu}$
- $\tan\theta = 2\mu$
- $\theta = \frac{\mu}{L}$

10. 0/1 points POE1 1997.MC.04. [1064530]

A force F is used to hold a block of mass m on an incline as shown in the diagram (see below). The plane makes an angle of θ with the horizontal and F is perpendicular to the plane. The coefficient of friction between the plane and the block is μ. What is the minimum force, F, necessary to keep the block at rest?



- μmg
- $mg\cos\theta$
- $mg\sin\theta$
- $\frac{mg}{\mu}\sin\theta$
- $\frac{mg}{\mu}(\sin\theta - \mu\cos\theta)$

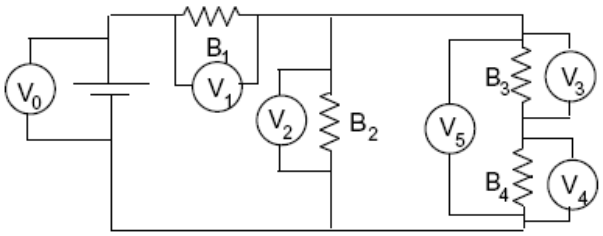
11. 0/1 points POE1 1999.MC.14. [1064630]

A thin ring of mass m and radius r rolls across the floor with a velocity v. Which of the following would be the best estimate of the ring's total kinetic energy as it rolls across the floor?

- mv^2
- $\frac{1}{2}mv^2$
- $\frac{1}{4}mv^2$
- $\frac{1}{2}mv^2 + \frac{mv^2}{r}$
- $\frac{1}{2}mv^2 + m\frac{r^2}{t^2}$

12. 0/1 points POE1 1997.MC.27. [1064565]

B_1, B_2, B_3, and B_4 are **identical** light bulbs. There are six voltmeters connected to the circuit as shown. All voltmeters are connected so that they display positive voltages. Assume that the voltmeters do not effect the circuit. If B_2 were to burn out, opening the circuit, what would happen to the reading of V_1? Let V be its original reading when all bulbs are functioning and let V' be its reading when B_2 is burnt out.



- $V' < 2V$
- $2V > V' > V$
- $V' = V$
- $V > V' > \frac{V}{2}$
- $\frac{V}{2} < V'$

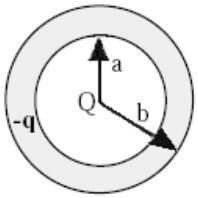
13. 0/1 points POE1 1997.MC.28. [1074707]

A particle with positive charge q and mass m travels along a path perpendicular to a magnetic field. The particle moves in a circle of radius R with frequency f. What is the magnitude of the magnetic field?

- $\frac{mf}{q}$
- $\frac{2\pi fm}{q}$
- $\frac{m}{2\pi fq}$
- $\frac{mc}{qR}$
- $\frac{\mu qf}{2\pi R}$

14. 0/1 points POE1 1997.MC.24. [1074708]

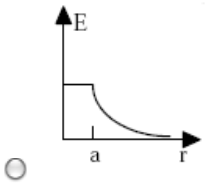
A spherical shell with an inner surface of radius *a* and an outer surface of radius *b* is made of conducting material. A charge *+Q* is placed at the center of the spherical shell and a total charge *-q* is placed on the shell. How is the charge *-q* distributed after it has reached equilibrium?

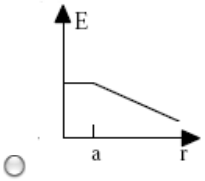


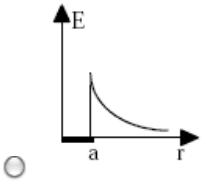
- *-Q* on the inner surface, *-q* on the outer surface.
- *+Q* on the inner surface, *-q-Q* on the outer surface.
- Zero charge on the inner surface, *-q* on the outer surface.
- The charge *-q* is spread uniformly between the inner and outer surface.
- *-Q* on the inner surface, *-q+Q* on the outer surface.

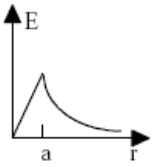
15. 0/1 points POE1 1998.MC.25. [1066388]

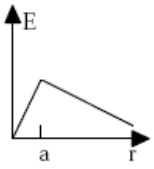
A charge is uniformly distributed through a volume of radius *a*. Which of the graphs below best represents the magnitude of the electric field as a function of distance from the center of the sphere?











Assignment Details