```
Q1 Q0 A helicopter lifts an 80 kg man vertically from the ground
   Q0 by means of a cable. The upward acceleration of the man
   Q0 is 2.0 m/s**2. Find the rate at which the work is being
   Q0 done on the man by the tension of the cable when the speed
   Q0 of the man is 1.5 m/s.
   Q0
   A1 1.4*10**3 W
   A2 1.1*10**3 W
   A3 1.2*10**4 W
   A4 1.8*10**3 W
   A5 2.5*10**4 W
   Q0
Q2 Q0 A force F = (3.00 i +7.00 j) N acts on a 2.00 kg object
   Q0 that moves from an initial position r1=(3.00i - 2.00j) m
   Q0 to a final position r2 = (5.00 i + 4.00 j) m in 4.00 s .
   Q0 What is the average power due to the force during that
   Q0 time interval?
   Q0
   A1 12.0 W
   A2 7.00 W
   A3 8.00 W
   A4 6.00 W
   A5 16.0 W
   Q0
Q3 Q0 A 5.0-kg block is moving horizontally at 6.0 m/s. In order to
   Q0 change its speed to 10.0 m/s, the net work done on the block
   Q0 must be :
   Q0
   A1 160 J
   A2 40  J
   A3 90  J
   A4 400 J
   A5 550 J
   Q0
Q4 Q0 A 3.00 kg block is dropped from a height of 40 cm onto a spring
   Q0 of spring constant k (see Fig 2). If the maximum distance the
   Q0 spring is compressed = 0.130 m, find k.
   Q0
   A1  1840 N/m
   A2  980  N/m
   A3  490  N/m
   A4  1250 N/m
   A5  2800 N/m
   Q0
Q5 Q0 A 6.0 kg box starts up a 30 degrees incline with 158 J of
   Q0 kinetic energy. How far will it slide up the incline if the
   Q0 coefficient of kinetic friction between box and incline is
   Q0 0.40 ?
   Q0
   A1 3.2 m
   A2 2.2 m
   A3 1.2 m
   A4 4.2 m
   A5 5.2 m
   Q0
```

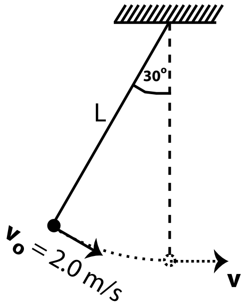

Figure 1

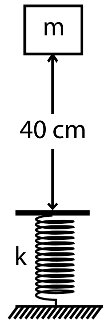

Figure 2

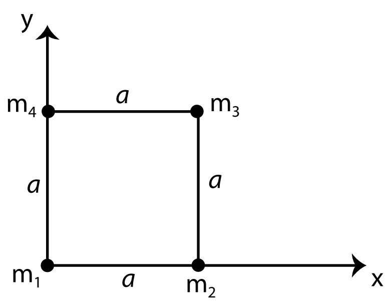

Figure 3

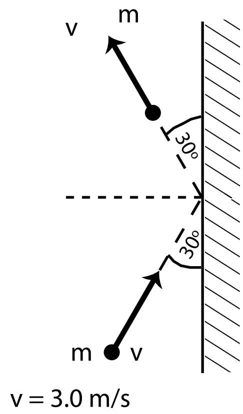

Figure 4

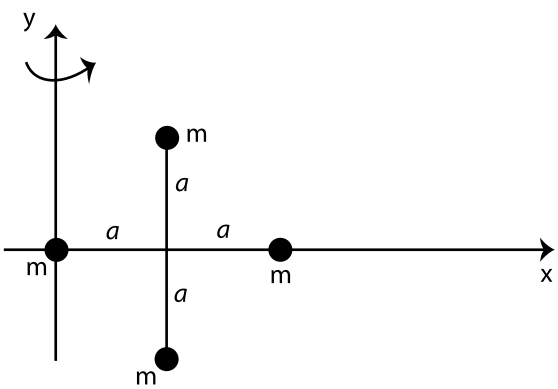

Figure 5

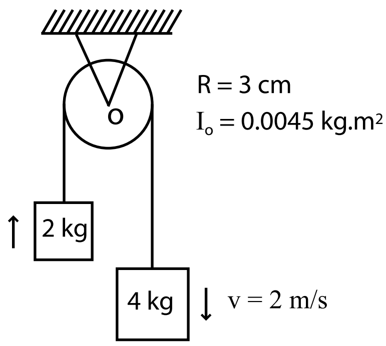

Figure 6

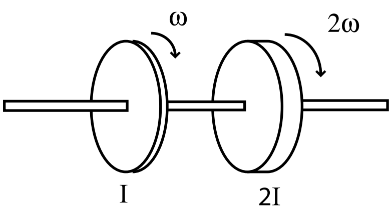

Figure 7

Q6 Q0 Fig 1 shows a pendulum of length L = 1.0 m. Its ball has
Q0 speed of vo=2.0 m/s when the cord makes an angle of 30
Q0 degrees with the vertical. What is the speed (V) of the
Q0 ball when it passes the lowest position?
Q0
A1 2.6 m/s
A2 3.8 m/s
A3 4.4 m/s
A4 5.2 m/s
A5 1.4 m/s
Q0
Q7 Q0 To pull a 100 kg object across a horizontal frictionless
Q0 floor, a worker applies a force of 220 N, directed 60 degrees
Q0 above the horizontal. As the object moves 5.0 m, what is the
Q0 work done on the object?
Q0
A1 550 J
A2 500 J
A3 400 J
A4 600 J
A5 650 J
Q0
Q8 Q0 Four masses, m1 = 1.0 kg, m2 = 2.0 kg, m3 = 3.0 kg and
Q0 m4 = 4.0 kg are placed at the corners of a square of side
Q0 a = 1.0 m, as shown in Fig 3. The x and y coordinates of
Q0 their center of mass are:
Q0
A1 (0.5 m, 0.7 m(
A2 (1.0 m, 1.0 m(
A3 (0.5 m, 0.5 m(
A4 (0.5 m, 0.0 m(
A5 (0.0 m, 0.0 m(
Q0
Q9 Q0 A 1.0 kg ball strikes a vertical wall at an angle of 30 degrees
Q0 with a speed of 3.0 m/s and bounces off at the same angle
Q0 with the same speed, as shown in Fig 4. The change in
Q0 momentum of the ball is :
Q0
A1 3 kg*m/s to the left
A2 9 kg*m/s to the left
A3 3 kg*m/s to the right
A4 0 kg*m/s
A5 6 kg*m/s upward
Q0
Q10Q0 A 6.0 kg body moving with velocity v breaks up (explodes) into
Q0 two equal masses. One mass travels east at 3.0 m/s and the
Q0 other mass travels north at 2.0 m/s. The speed v of the
Q0 6.0 kg mass is:
Q0
A1 1.8 m/s
A2 5.0 m/s
A3 1.0 m/s
A4 2.0 m/s
A5 3.0 m/s
Q0
Q11Q0 In an inelastic collision between two objects with no external
Q0 forces,
Q0
A1 momentum is conserved but kinetic energy is not conserved
A2 kinetic energy is conserved but momentum is not conserved
A3 both momentum and kinetic energy are conserved

```
   A4 neither momentum nor kinetic energy are conserved
   A5 kinetic energy is equal to half of momentum
   Q0
Q12Q0 A 1.0 kg ball falling vertically hits a floor with a velocity
   Q0 of 3.0 m/s and bounces vertically up with a velocity of 2.0 m/s .
   Q0 If the ball is in contact with the floor for 0.10 s, the
   Q0 average force on the floor by the ball is:
   Q0
   A1 50 N down
   A2 30 N down
   A3 0  N
   A4 20 N up
   A5 40 N up
   Q0
Q13Q0 A 2.0 kg block with a speed of 4.0 m/s undergoes a head on
   Q0 ELASTIC collision with a 4.0 kg block initially at rest. After
   Q0 the collision, the 4.0 kg block has 14.2 J of kinetic energy .
   Q0 The speed of the 2.0 kg block after the collision is:
   Q0
   A1 1.3 m/s
   A2 4.0 m/s
   A3 0   m/s
   A4 2.0 m/s
   A5 2.6 m/s
   Q0
Q14Q0 A wheel initially has an angular velocity of 18 rad/s but it is
   Q0 slowing at a constant rate of 2.0 rad/s**2. The time it takes
   Q0 to stop is :
   Q0
   A1 9.0  s
   A2 3.0  s
   A3 6.0  s
   A4 12.0 s
   A5 0.   s
   Q0
Q15Q0 Two wheels A and B are identical. Wheel B is rotating with
   Q0 twice the angular velocity of wheel A.  The ratio of the radial
   Q0 acceleration of a point on the rim of B (a2) to the radial
   Q0 acceleration of a point on the rim of A (a1) is (a2/a1 :(
   Q0
   A1 4
   A2 2
   A3 1/2
   A4 1/4
   A5 1
   Q0
Q16Q0 Four identical particles, each with mass m, are arranged in the
   Q0 x, y plane as shown in Fig 5. They are connected by light sticks
   Q0 of negligible mass to form a rigid body. If m = 2.0 kg and
   Q0 a = 1.0 m, the rotational inertia of this system about the
   Q0 y-axis is:
   Q0
   A1 12  kg*m**2
   A2 4.0 kg*m**2
   A3 8.0 kg*m**2
   A4 16  kg*m**2
   A5 0   kg*m**2
   Q0
Q17Q0 Fig 6 shows a pulley (R=3.0 cm and Io= 0.0045 kg*m**2 (
   Q0 suspended from the ceiling. A rope passes over it with a 2.0 kg
   Q0 block attached to one end and a 4.0 kg block attached to the
```

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   Q0 other. When the speed of the heavier block is 2.0 m/s
   Q0 the total kinetic energy of the pulley and blocks is :
   Q0
   A1  22  J
   A2  10  J
   A3  2   J
   A4  16  J
   A5  38  J
   Q0
Q18Q0 A 3.0 kg wheel, rolling smoothly on a horizontal surface, has
   Q0 a rotational inertia about its axis= M*R**2/2, where M is its
   Q0 mass and R is its radius. A horizontal force is applied to the
   Q0 axle so that the center of mass has an acceleration of
   Q0 2.0 m/s**2. The magnitude of the frictional force of the
   Q0 surface is :
   Q0
   A1 3.0 N
   A2 6.0 N
   A3 9.0 N
   A4 12  N
   A5 0   N
   Q0
Q19Q0 Fig 7 shows two disks mounted on bearings on a common axis .
   Q0 The first disk has rotational inertia I and is spinning with
   Q0 angular velocity w. The second disk has rotational inertia 2I
   Q0 and is spinning in the same direction as the first disk with
   Q0 angular velocity 2w. The two disks are slowly forced toward each
   Q0 other along the axis until they stick and have a final common
   Q0 angular velocity of:
   Q0
   A1 5*w/3
   A2 w*sqrt(3(
   A3 w
   A4 3*w
   A5 2*w
   Q0
Q20Q0 A hoop has a mass of 200 grams and a radius of 25 cm. It rolls
   Q0 without slipping along a level ground at 500 cm/s. Its total
   Q0 kinetic energy is :
   Q0
   A1 5  J
   A2 25 J
   A3 10 J
   A4 2  J
   A5 0  J
```