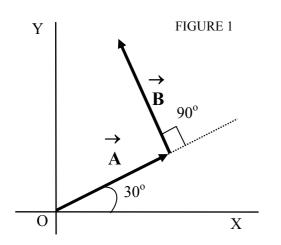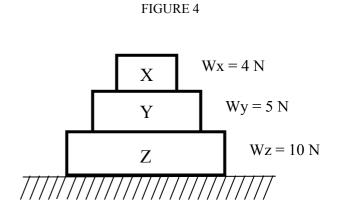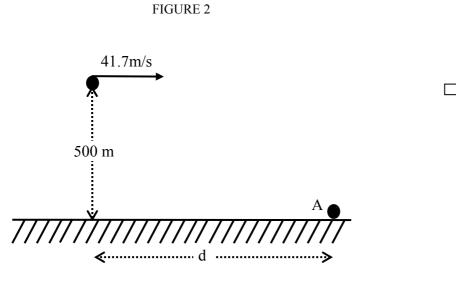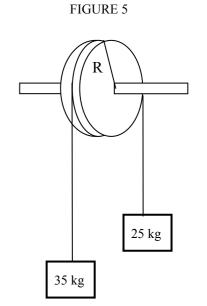Q1 Q0 Speed of sound is 340 m/s. Express this in millimeters
ch Q0 per nanosecond[1 ns = 10**(-9)s].
1. Q0
   A1 3.40* 10**(-4) mm/ns
   A2 3.40* 10**(-6) mm/ns
   A3 3.40* 10**(-3) mm/ns
   A4 3.40* 10**(+3) mm/ns
   A5 3.40* 10**(+6) mm/ns
   Q0
Q2 Q0 The position of an object moving along an X-axis is
ch Q0 given by x = 3 + 12*t - t**3, where x is in meters
2 Q0 and t is in seconds. At what time is the particle
   Q0 momentarily at rest?
   Q0
   A1 2 s
   A2 4 s
   A3 3 s
   A4 1 s
   A5 0 s
   Q0
Q3 Q0 A rock is dropped (Vo =0) from a 100-m high cliff. It
ch Q0 takes the rock 3.2 s to fall the first 50 m. How long
2 Q0 does it take to fall the second 50 m?
   Q0
   A1 1.3 s
   A2 1.6 s
   A3 4.8 s
   A4 3.2 s
   A5 0.0 s
   Q0
Q4 Q0 The position-time graph for an object is a straight line
Ch Q0 with a positive slope. The object has
2 Q0
   A1 a constant velocity
   A2 a decreasing acceleration
   A3 an increasing velocity
   A4 an increasing acceleration
   A5 a decreasing velocity
   Q0
Q5 Q0 A balloon is going up with a speed of 10 m/s and is
ch Q0 100 m above the ground when a package is dropped from
2 Q0 the balloon. How long does the package take to reach
   Q0 the ground?
   Q0
   A1 5.7 s
   A2 4.0 s
   A3 3.7 s
   A4 2.0 s
   A5 6.0 s
Q6 Q0
ch Q0 The two vectors A and B shown in Fig. 1 have equal
3 Q0 magnitudes of 10.0 m. Find the magnitude of the
   Q0 resultant, R, of these vectors and the angle theta
   Q0 it makes with the positive x-axis.
   Q0
   A1 R = 14.1 m, THETA = 75 degrees
   A2 R = 10.0 m, THETA = 90 degrees
   A3 R = 12.0 m, THETA = 60 degrees
   A4 R = 16.0 m, THETA = 30 degrees
   A5 R = 20.0 m, THETA = 45 degrees
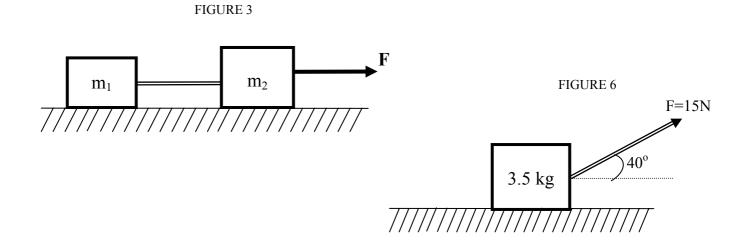
FIGURE 1

Y

$\vec{B}$

90°

$\vec{A}$

30°

O

X

FIGURE 4

X   Wx = 4 N

Y   Wy = 5 N

Z   Wz = 10 N

FIGURE 2

41.7m/s

500 m

A

d

FIGURE 5

R

25 kg

35 kg

FIGURE 3

m_1 m_2 **F**

FIGURE 6

F=15N

40°

3.5 kg

Q0

Q7 Q0 A vector in the xy-plane has a magnitude of 25.0 and
ch Q0 an x-component of 12.0. The angle that it makes with
Q0 the positive x-axis is:
3 Q0

A1 61.3 degrees
A2 25.6 degrees
A3 28.7 degrees
A4 64.3 degrees
A5 95.3 degrees
Q0

Q8 Q0 The unit vectors in the positive directions of the x,
ch Q0 y, and z axes are labeled i, j, and k. The value of
3 Q0 [i.(j x k)] is:
Q0

A1 +1
A2 -1
A3 0
A4 -i
A5 +j
Q0

Q9 Q0 Car A is moving with a speed of 30 km/h along the
ch Q0 positive x-axis and car B is moving with a speed of
4 Q0 40 km/h along the positive y-axis. What is the
Q0 velocity of car B with respect to car A?
Q0

A1 (-30i + 40j) km/h
A2 (30i + 40j) km/h
A3 (-30i - 40j) km/h
A4 (40i + 30j) km/h
A5 (40i - 30j) km/h
Q0

Q10 Q0 A ball leaves the ground with a speed of 50 m/s at
ch Q0 an angle of 60 degrees with the horizontal. Find its
4 Q0 speed at its heighest point.
Q0

A1 25 m/s
A2 50 m/s
A3 0.0 m/s
A4 43 m/s
A5 10 m/s
Q0

Q11 Q0 A stone is thrown from the ground into the air with
ch Q0 an initial velocity V = (5.0i + 9.0j) m/s. To what
4 Q0 maximum height will the stone rise?
Q0

A1 4.1 m
A2 1.3 m
A3 9.0 m
A4 5.0 m
A5 7.0 m
Q0

Q12 Q0 The airplane shown in Fig. 2 is in level flight at an
ch Q0 altitude of 500 m and a speed of 41.7 m/s. At what
4 Q0 distance d should it release a bomb to hit the target
q0 at point A?
Q0

A1 421 m
A2 150 m
A3 300 m
A4 590 m

A5 832 m

Q13 A constant force, F, acts on a 19-kg particle. The particle, initially at rest, moves a distance of 22 m in 3.8 s. Find the magnitude of the force F.

A1 58 N
A2 86 N
A3 50 N
A4 41 N
A5 12 N

Q14 In Fig.3, m1 = 22 kg and m2 = 37 kg. The masses are connected by a light, horizontal cord and are being pulled across a smooth level surface by a horizontal force F = 46 N. Find the tension in the cord.

A1 17 N
A2 29 N
A3 46 N
A4 31 N
A5 63 N

Q15 Three books (X, Y, and Z) rest on a table as shown in Fig. 4. The weight of each book is also indicated in the Figure. The magnitude of the force of book Z on book Y is:

A1 9.0 N
A2 4.0 N
A3 5.0 N
A4 14 N
A5 19 N

Q16 Two blocks weighing 25 kg and 35 kg respectively, are connected by a string that passes over a massless pulley as shown in Fig. 5. The tension in the string is:

A1 286 N
A2 210 N
A3 500 N
A4 350 N
A5 250 N

Q17 A 90-kg man stands in an elevator that is moving up at a constant speed of 5.0 m/s. The magnitude of the force exerted by him on the floor is:

A1 882 N
A2 0   N
A3 94 N
A4 450 N
A5 49 N

Q18 A 3.5-kg block is pulled at constant velocity along a horizontal floor by a force F = 15 N that makes an angle of 40 degrees with the horizontal (Fig.6). Find the magnitude of the force of friction between the block and the floor

A1 11 N
A2 15 N

A3 34 N
A4 0.0 N
A5 26 N

Q19 Find the minimum coefficient of static friction between the tyres of a car and a level road if the car is to make a circular turn of radius 90 m at a speed of 60 km/h.

A1 0.315
A2 0.521
A3 0.423
A4 0.214
A5 0.125

Q20 One end of a 1.0-m string is fixed, the other end is attached to a 1.0-kg stone. The stone swings in a vertical circle, and has a speed of 5.0 m/s at the top of the circle. The tension in the string at this point is approximately:

A1 15 N
A2 11 N
A3 28 N
A4 31 N
A5 10 N