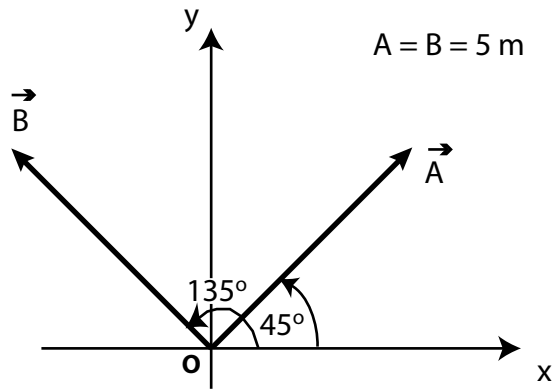
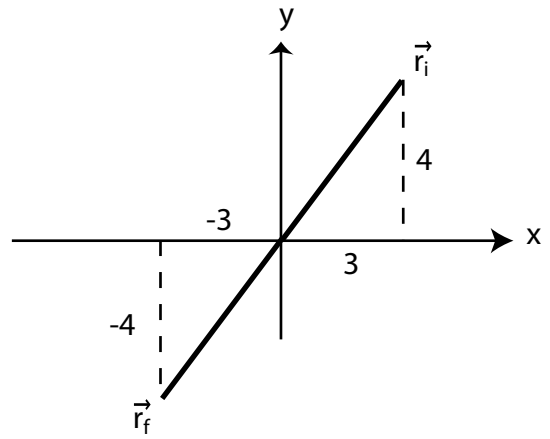


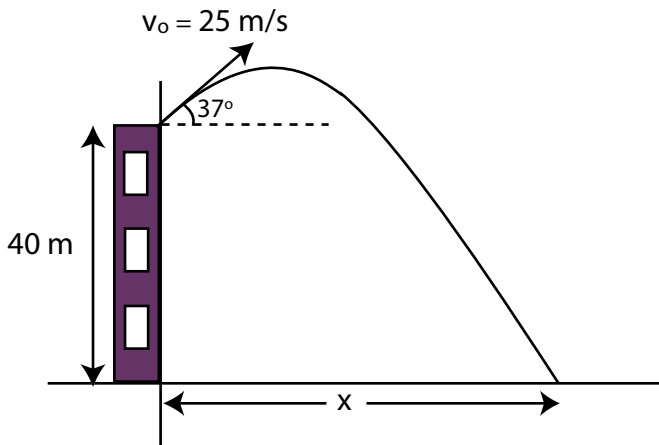
- Q1 Q0 Express speed of sound, 330 m/s in miles/h .  
Q0 (1 mile = 1609 m ( )  
Q0  
A1 738 miles/h  
A2 330 miles/h  
A3 147 miles/h  
A4 0.205 miles/h  
A5 980 miles/h  
Q0
- Q2 Q0 A cylindrical can, 6.00 inches high and 3.00 inches in diameter  
Q0 is filled with water. Density of water is 1.00 g/cm<sup>3</sup>. What is  
Q0 the mass of water in the can in gram ?  
Q0 (1 inch = 2.54 cm .( )  
Q0  
A1 695 g  
A2 277 g  
A3 182 g  
A4 107 g  
A5 2780 g  
Q0
- Q3 Q0 A particle moves along the x axis from  $X_i$  to  $X_f$  .  
Q0 Of the following values of the initial and final  
Q0 coordinates, which one results in the displacement  
Q0 with the largest magnitude?  
Q0  
A1  $X_i = -4$  m ,  $X_f = 4$  m  
A2  $X_i = -4$  m ,  $X_f = -8$  m  
A3  $X_i = -4$  m ,  $X_f = 2$  m  
A4  $X_i = 4$  m ,  $X_f = -2$  m  
A5  $X_i = 4$  m ,  $X_f = 6$  m  
Q0
- Q4 Q0 Each of the following four particles move along an  
Q0 x axis. Their coordinates as functions of time  
Q0 are given by:  
Q0 particle 1:  $x(t) = 3.5 - 2.7t^4$   
Q0 particle 2:  $x(t) = 3.5 + 2.7t^3$   
Q0 particle 3:  $x(t) = 3.5 + 2.7t^2$   
Q0 particle 4:  $x(t) = 3.5 - 3.4t - 2.7t^2$   
Q0 Which of these particles have constant acceleration?  
Q0  
A1 Only 3 and 4  
A2 All four  
A3 Only 1 and 2  
A4 Only 2 and 3  
A5 None of them  
Q0
- Q5 Q0 Starting at time  $t = 0$ , an object moves along a straight line.  
Q0 Its coordinate in meters is given by  $x(t) = 75t - 1.0t^3$  ,  
Q0 where  $t$  is in s. When velocity ( $v$ ) of the object = 0, the value  
Q0 of its acceleration is :  
Q0  
A1 -30 m/s<sup>2</sup>  
A2 0 m/s<sup>2</sup>  
A3 -75 m/s<sup>2</sup>  
A4 -9.8 m/s<sup>2</sup>  
A5 100 m/s<sup>2</sup>  
Q0



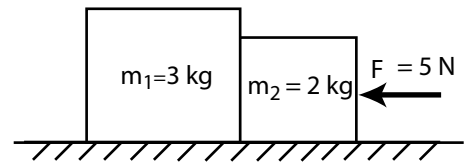
**Figure 1**



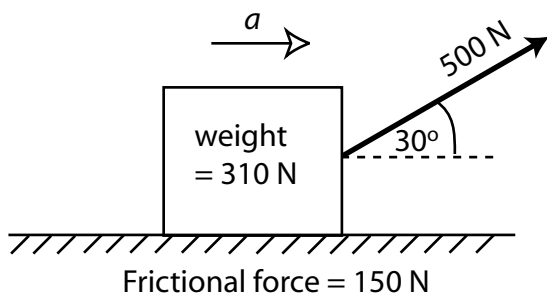
**Figure 2**



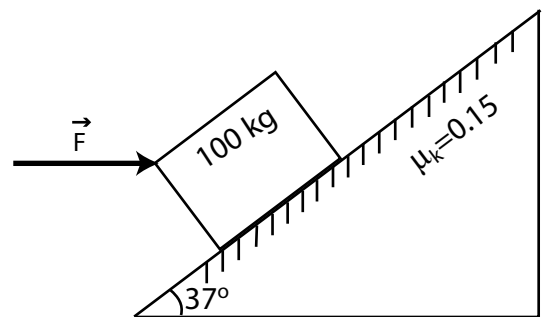
**Figure 3**



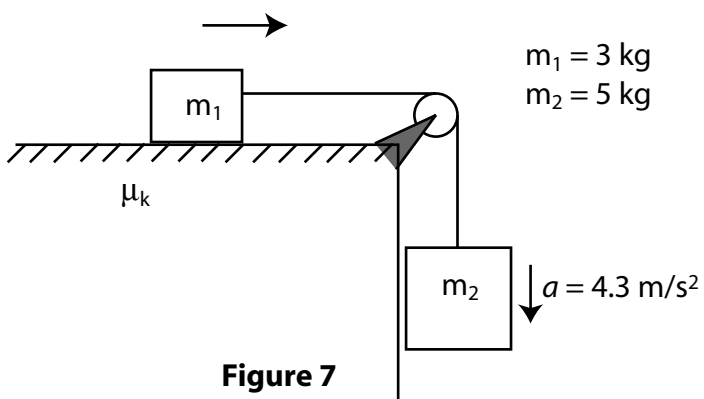
**Figure 4**



**Figure 5**



**Figure 6**



**Figure 7**

- Q6 Q0 A ball is dropped from the top of a building having height  $H$ .  
 Q0 If it hits the ground 2.1 s later, find the height of the  
 Q0 building,  $H$ .  
 Q0  
 A1 22 m  
 A2 35 m  
 A3 76 m  
 A4 96 m  
 A5 12 m  
 Q0
- Q7 Q0 Two vectors  $A$  and  $B$  are shown in Fig 1. Each vector has  
 Q0 a magnitude of 5.0 m. Find the magnitude of the resultant  
 Q0 vector  $R = A + B$  and the angle ( $\theta$ ) between  $R$  and the  
 Q0 positive x-axis (counter clockwise).  
 Q0  
 A1 magnitude = 7.1 m,  $\theta = 90$  degrees  
 A2 magnitude = 10 m,  $\theta = 45$  degrees  
 A3 magnitude = 10 m,  $\theta = 30$  degrees  
 A4 magnitude = 7.1 m,  $\theta = 0$  degree  
 A5 magnitude = 5.0 m,  $\theta = 90$  degrees  
 Q0
- Q8 Q0 Vector  $A$  has components  $A_x = 4.0$ ,  $A_y = -3.0$  .  
 Q0 Vector  $B$  has components  $B_x = 8.0$ ,  $B_y = 6.0$ .  
 Q0 Find the angle between the two vectors.  
 Q0  
 A1 74 degrees  
 A2 60 degrees  
 A3 0 degree  
 A4 90 degrees  
 A5 45 degrees  
 Q0
- Q9 Q0 Three vectors are  $A = 1.00 i + 2.00 j - 3.00 k$  ,  
 Q0  $B = 3.00 k$  and  $C = 6.00 i - 7.00 j$   
 Q0 Find  $2C \cdot (A \times B)$ .  
 Q0  
 A1 114  
 A2  $7.00 i - 5.00 j$   
 A3 30 i  
 A4 -114  
 A5 120  
 Q0
- Q10 Q0 The position of a particle is initially  
 Q0  $r_i = (3.0 \text{ m})i + (4.0 \text{ m})j$ , and 10 s later it  
 Q0 is  $r_f = -(3.0 \text{ m})i - (4.0 \text{ m})j$  (see Fig 2). What is  
 Q0 its average velocity during this time interval ?  
 Q0  
 A1  $(-0.6i - 0.8j) \text{ m/s}$   
 A2  $(0.6i + 0.8j) \text{ m/s}$   
 A3 0 m/s  
 A4 10 m/s, at angle 45 degree  
 A5 10 m/s, at angle -45 degree  
 Q0
- Q11 Q0 A ball is kicked from the roof of a building  
 Q0 with an initial velocity of 25 m/s at an angle  
 Q0 of 37 degrees to the horizontal(see Fig 3). How far  
 Q0 from the base of the building will the ball land?  
 Q0 (The height of the building is 40 m)  
 Q0  
 A1 95 m  
 A2 66 m  
 A3 34 m

A4 48 m

A5 133 m

Q0

Q12Q0 A satellite is placed in a circular orbit  $8.0 \times 10^3$  km from  
Q0 the center of the earth. If it takes the satellite 2.0 hours  
Q0 to complete one revolution, what is its centripetal  
Q0 acceleration?

Q0

A1  $6.1 \text{ m/s}^2$  towards the center of the earth

A2  $6.1 \text{ m/s}^2$  away from the center of the earth

A3  $2.4 \text{ m/s}^2$  toward the center of the earth

A4  $2.4 \text{ m/s}^2$  away from the center of the earth

A5 almost zero

Q0

Q13Q0 A boat is sailing due North at a speed of 4.0 m/s with  
Q0 respect to the water of a river. If the water is  
Q0 moving due East at a speed of 3.0 m/s relative to the  
Q0 ground, what is the velocity of the boat relative to  
Q0 the ground?

Q0

A1 5.0 m/s making an angle 37 degrees east of north

A2 5.0 m/s making an angle 53 degrees east of north

A3 5.0 m/s east of north

A4 1.0 m/s west of south

A5 1.0 m/s west

Q0

Q14Q0 Two blocks are in contact on a frictionless table .

Q0 A horizontal force is applied to block ( $m_2$ ), as shown

Q0 in Fig. 4. If  $m_1=3.0$  kg,  $m_2=2.0$  kg, and  $F=5.0$  N, find the

Q0 magnitude of the force between the two blocks.

Q0

A1 3.0 N

A2 2.0 N

A3 4.0 N

A4 5.0 N

A5 4.7 N

Q0

Q15Q0 A worker drags a crate across a factory floor by pulling on

Q0 a rope tied to the crate as shown in Fig.5. The worker exerts

Q0 a force of 500 N on the rope, which is inclined at 30 degrees

Q0 to the horizontal, and the floor exerts a frictional force of

Q0 150 N. Calculate the magnitude of the acceleration of the crate

Q0 if its weight is 310 N.

Q0

A1  $8.9 \text{ m/s}^2$

A2  $6.0 \text{ m/s}^2$

A3  $7.0 \text{ m/s}^2$

A4  $2.0 \text{ m/s}^2$

A5  $12 \text{ m/s}^2$

Q0

Q16Q0 In Fig. 6 a 100 kg block is pushed at a constant speed up

Q0 the rough 37 degrees ramp by a horizontal force  $F$ .

Q0 The coefficient of kinetic friction between block and

Q0 surface is 0.15. What is the magnitude of force  $F$ ?

Q0

A1 998 N

A2 660 N

A3 450 N

A4 570 N

A5 1850 N

Q0

Q17Q0 A block ( $m_1 = 3.0 \text{ kg}$ ) on a rough horizontal plane is connected  
Q0 to a second block ( $m_2 = 5.0 \text{ kg}$ ) by a cord over a massless pulley.  
Q0 Calculate the coefficient of kinetic friction between the  
Q0 block  $m_1$  and the table if the acceleration of the descending  
Q0 block  $m_2$  is  $4.3 \text{ m/s}^2$  (see Fig 7.)

Q0

A1 0.50

A2 0.25

A3 0.35

A4 0.75

A5 0.65

Q0

Q18Q0 A car is rounding a flat curve of radius  $R = 220 \text{ m}$  with speed  $v$   
Q0 =  $94 \text{ km/h}$ . What is the magnitude of the force exerted by the  
Q0 seat on the passenger whose mass  $m$  is  $85 \text{ kg}$ .

Q0

A1 263 N

A2 325 N

A3 455 N

A4 650 N

A5 100 N

Q0

Q19Q0 An object moving in a circle at constant speed:

Q0

A1 has an acceleration of constant magnitude.

A2 has a constant acceleration.

A3 has a constant velocity .

A4 is held to its path by centrifugal force (a force directed

A4 away from the center .)

A5 has an acceleration that is tangent to the circle.

Q0

Q20Q0 Acceleration is always in the direction:

Q0

A1 of the net force .

A2 of the initial velocity .

A3 of the final velocity.

A4 of the displacement.

A5 opposite to the frictional force.