

Q1 Q0 Speed of sound is 330 m/s. Express this in miles  
ch Q0 per hour ( 1 mile = 1609 m).

1. Q0

- A1 738 miles/h
- A2 533 miles/h
- A3 945 miles/h
- A4 853 miles/h
- A5 443 miles/h

Q0

Q2 Q0 The average radius of a nucleus is  $R = 10.0$  fm.

ch Q0 Find the density of the nucleus which has a mass

1. Q0 of  $15u$  [ $1 \text{ fm} = 10^{(-15)}\text{m}$ ,  $1 u = 1.66 \cdot 10^{(-27)}\text{kg}$ ].

Q0

- A1  $5.94 \cdot 10^{15} \text{ kg/m}^3$
- A2  $5.94 \cdot 10^{-5} \text{ kg/m}^3$
- A3  $1.66 \cdot 10^{-27} \text{ kg/m}^3$
- A4  $1.68 \cdot 10^{-15} \text{ kg/m}^3$
- A5  $2.94 \cdot 10^5 \text{ kg/m}^3$

Q0

Q3 Q0 How far does the runner whose velocity - time graph

ch Q0 is shown in Fig.1 travel in 10 s?

2 Q0

- A1 20 m
- A2 24 m
- A3 28 m
- A4 32 m
- A5 16 m

Q0

Q4 Q0 A car travelling 20.0 m/s is 30.0 m from a wall

ch Q0 when the driver slams on the brakes. The car hits the

2 Q0 wall 2.00 s later. How fast is the car travelling

Q0 when it hits the wall?

Q0

- A1 10.0 m/s
- A2 11.8 m/s
- A3 5.60 m/s
- A4 7.45 m/s
- A5 8.50 m/s

Q0

Q5 Q0 The position of a particle moving along the x axis

Ch Q0 is described by the equation  $x(t) = 5.0 + 2.0t + t^3$ .

2 Q0 Find its average acceleration for the time interval

Q0  $t = 1.0 \text{ s}$  to  $t = 2.0 \text{ s}$ .

Q0

- A1  $9.0 \text{ m/s}^2$

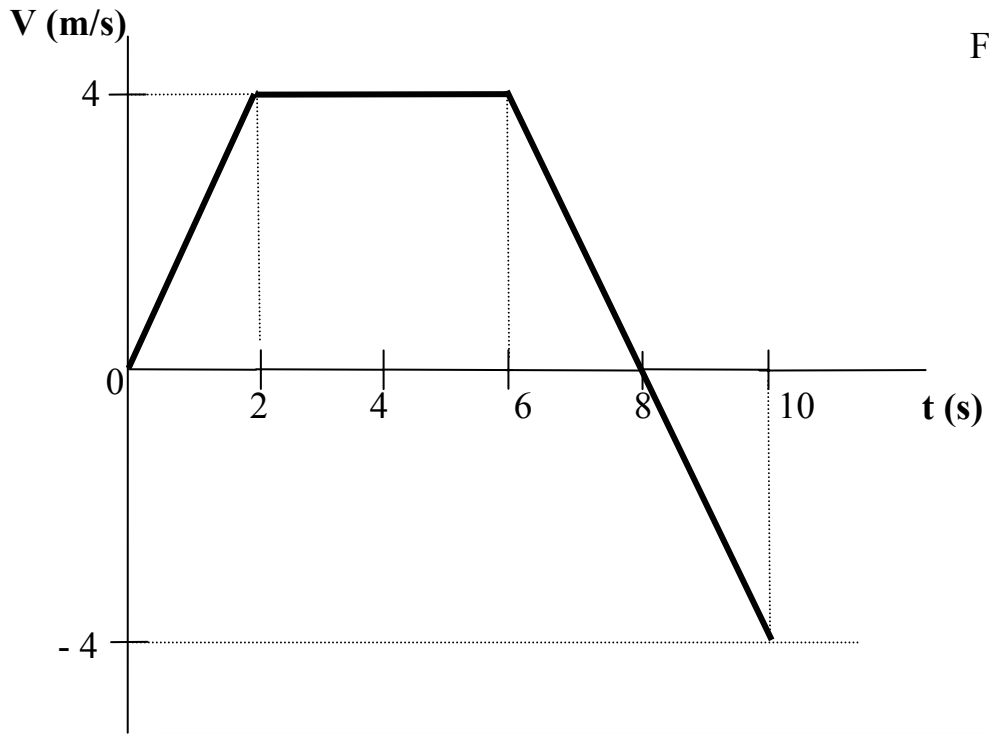


FIGURE-1

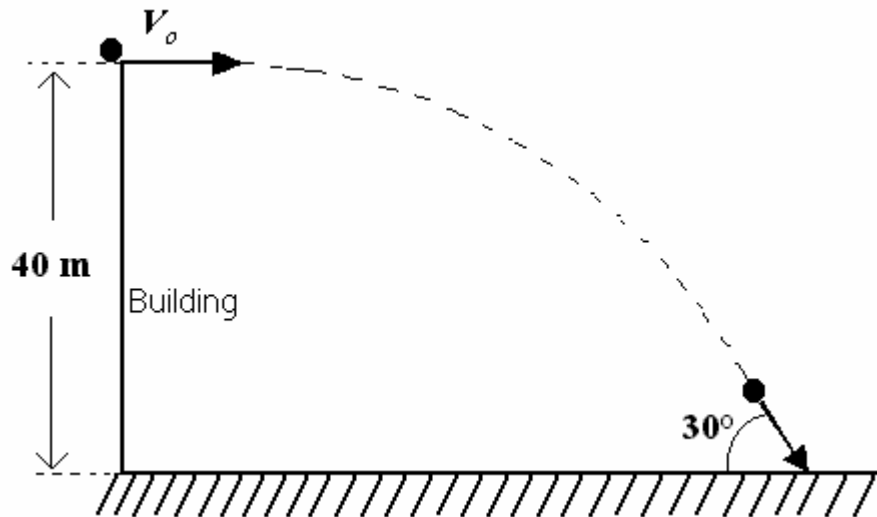


FIGURE-2

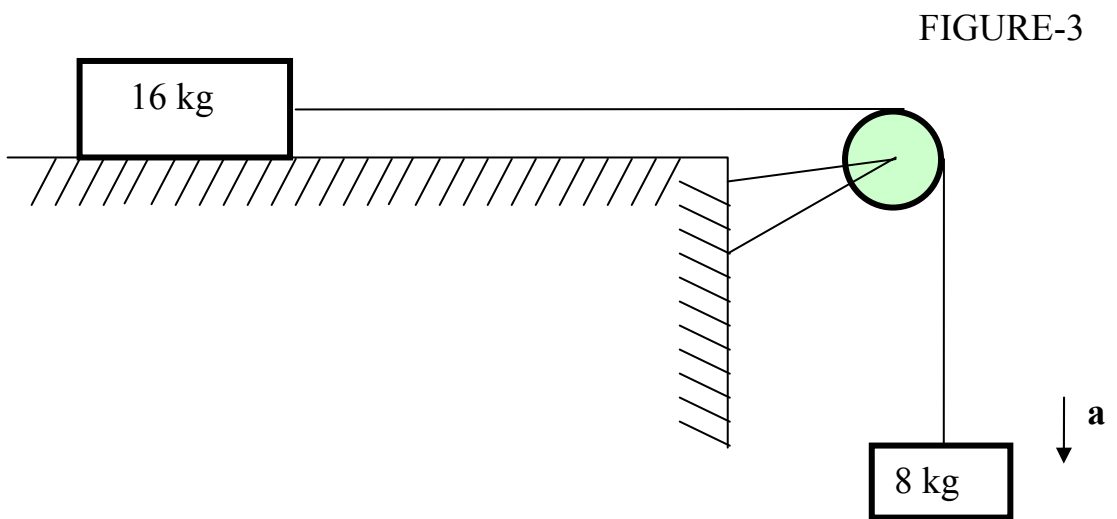


FIGURE-3

- A2 7.3 m/s\*\*2
- A3 5.0 m/s\*\*2
- A4 11 m/s\*\*2
- A5 13 m/s\*\*2

Q0

Q6 Q0 A ball is thrown vertically upward with an initial  
ch Q0 velocity  $v_0$  and reaches its maximum height in 6.0 s.  
2 Q0 After how many seconds will it have a velocity  $-v_0/2$ ?

Q0

- A1 9.0 s
- A2 12 s
- A3 6.0 s
- A4 18 s
- A5 15 s

Q7 Q0

ch Q0 Vector  $A = (5.0i + 3.0j)m$ , and vector B is 6m in length  
3 Q0 and making 120 degrees angle with +ve x-axis. Find

Q0  $A - B$ .

Q0

- A1 ( 8.0 i - 2.2j )m
- A2 ( 8.0 i + 8.2j )m
- A3 (-2.0 i + 8.2j )m
- A4 ( 2.0 i - 5.6j )m
- A5 ( 2.0 i + 7.5j )m

Q0

Q8 Q0 If  $a = (3.0i + 4.0j)m$  and  $b = (5.0i - 2.0j)m$ , find the angle  
ch Q0 between the two vectors.

3 Q0

- A1 75 degrees
- A2 31 degrees
- A3 82 degrees
- A4 55 degrees
- A5 93 degrees

Q0

Q9 Q0 For the following three vectors;

ch Q0  $A = 2i + 3j + 4k$ ,  $B = 4i + 4j$  and  $C = 2i + 2k$ , find  $A \cdot (B \times A)$ .

3 Q0

A1 0

- A2  $-16i + 16j - 8k$
- A3  $16i - 16j + 8k$
- A4  $8i - 8j - 8k$
- A5  $-8i + 8j + 8k$

Q0

Q10 Q0 A plane traveling north at 200 m/s turns and then travels  
ch Q0 south at 200 m/s. The change in its velocity is:

4 Q0

A1 400 m/s South

A2 400 m/s North

A3 200 m/s North

A4 200 m/s South

A5 0 m/s

Q0

Q11Q0 A stone is thrown horizontally from the top of a 40m  
ch Q0 high hill. It strikes the ground at an angle of 30

4 Q0 degrees as shown in Fig.2. With what speed was it  
Q0 thrown?

Q0

A1 49 m/s

A2 19 m/s

A3 10 m/s

A4 98 m/s

A5 0 m/s

Q0

Q12Q0 A particle starts from the origin at  $t = 0$  with a velocity  
ch Q0 of  $8.0\mathbf{j}$  m/s and moves in the XY plane with a constant

4 Q0 acceleration of  $(4.0\mathbf{i} + 2.0\mathbf{j})\text{m/s}^2$ . At the instant the

Q0 X coordinate of the particle is 32 m, find its y coordinate.

Q0

A1 48 m

A2 24 m

A3 32 m

A4 16 m

A5 64 m

Q0

Q13Q0 A river has a steady flow of 0.30 m/s. A student swims  
ch Q0 downstream a distance of 1.2 km and returns to the starting

4 Q0 point. If the student can swim at a constant speed of

Q0  $v$  in still water and the downstream portion of the swim

Q0 takes him 20 minutes, the time required for the entire

Q0 swim is:

Q0

A1 70 minutes

A2 50 minutes

A3 20 minutes

A4 90 minutes

A5 0 minutes

Q0

Q14Q0 A 16-kg block and an 8-kg block is connected by a string

Q0 as shown in Fig.3.If the pulley is massless and the

ch Q0 surface is frictionless, the magnitude of the acceleration

5 Q0 of the 8-kg block is:

Q0

A1  $g/3$

A2  $3g/5$

A3  $4g/3$

A4  $g$

A5  $g/2$

Q0

Q15Q0 A 70-kg man stands on a spring scale in an elevator  
ch Q0 that has a downward acceleration of  $2.8 \text{ m/s}^2$ . The

5 Q0 scale will read:

Q0

A1 490 N

A2 980 N

A3 686 N

A4 343 N

A5 170 N

Q0

Q16Q0 Acceleration is always in the direction:

ch Q0

5 A1 of the net force

A2 of the displacement

A3 of the initial velocity

A4 of the final velocity

A5 opposite to the frictional force

Q0

Q17Q0 A person pulls a 50-kg box horizontally with a constant  
ch Q0 horizontal force of 200 N. If the coefficient of kinetic

6 Q0 friction  $\mu_k$  is 0.2 and the coefficient of static friction

6 Q0  $\mu_s$  is 0.3. Find the acceleration of the box.

Q0

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

A2  $1 \text{ m/s}^2$

A3  $4 \text{ m/s}^2$

A4  $-1 \text{ m/s}^2$

A5  $0 \text{ m/s}^2$

Q0

Q18Q0 A block of mass  $M = 10 \text{ kg}$  is pushed up along a 30 degree  
ch Q0 inclined plane with a force  $F$  parallel to the inclined

6 Q0 plane. If the velocity of the block is constant and

Q0 the coefficient of kinetic friction  $\mu_k$  is 0.2, find

Q0 the magnitude of the force.

Q0

A1 66 N

A2 95 N

A3 17 N  
A4 6.7 N  
A5 98 N

Q0

Q19Q0 An object moving at constant speed in a circular path

ch Q0

6 A1 has an acceleration of constant magnitude  
A2 has an acceleration of constant direction  
A3 has zero acceleration  
A4 has constant velocity  
A5 has a zero net force acting on it

Q0

Q20Q0 A motorcycle and 60.0 kg rider accelerate at  $3.00 \text{ m/s}^2$

5 Q0 up an inclined plane  $10.0^\circ$  above the horizontal.

Q0 Find the magnitude of the net force acting on the rider.

Q0

A1 180 N

A2 588 N

A3 102 N

A4 282 N

A5 78 N

Q0

Q21Q0 A monkey hangs vertically from a rope in a descending

ch Q0 elevator that decelerates at  $2.4 \text{ m/s}^2$ . If the tension

5 Q0 in the rope is 400 N, find the mass of the monkey.

Q0

A1 33 kg

A2 54 kg

A3 41 kg

A4 167 kg

A5 25 kg

Q0

Q22Q0 One end of a 1.0-m string is fixed, the other end is attached

ch Q0 to a 2.0-kg stone. The stone swings in a vertical circle,

6 Q0 and has a speed of 4.0 m/s at the top of the circle.

Q0 The tension in the string at this point is approximately:

Q0

A1 12 N

A2 0 N

A3 20 N

A4 32 N

A5 9.8 N