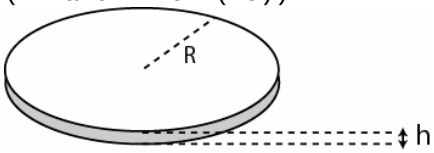
EXAM 1 – 041

Q1 Q0 1 shake = 10**-8 seconds. Find out how many
Q0 nano seconds (ns) are there in 1 shake.
Q0 (1 nano = 10**(-9))
Q0
A1 10 ns
A2 0.01 ns
A3 100 ns
A4 0.001 ns
A5 0.1 ns
Q0

Q2 Q0 A drop of oil (mass = 0.90 milligram and density = 918
Q0 kg/m**3) spreads out on a surface and forms a circular
Q0 thin film of radius = 41.8 cm and thickness h
Q0 (see Fig 8). Find h in nano meter (nm).
Q0 (1 nano = 10**(-9))

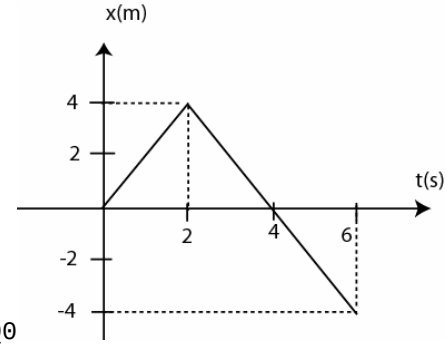


Q0
A1 1.8 nm
A2 0.00060 nm
A3 0.15 nm
A4 0.60 nm
A5 0.030 nm
Q0

Q3 Q0 A man runs on a straight road for 8.0 km at a speed
Q0 of 8.0 km/h. He then continues in the same direction
Q0 for another 6.0 km at a speed of 12 km/h. What is his
Q0 average speed during this 14 km run?
Q0
A1 9.3 km/h
A2 10 km/h
A3 4.0 km/h
A4 11 km/h
A5 1.5 km/h
Q0

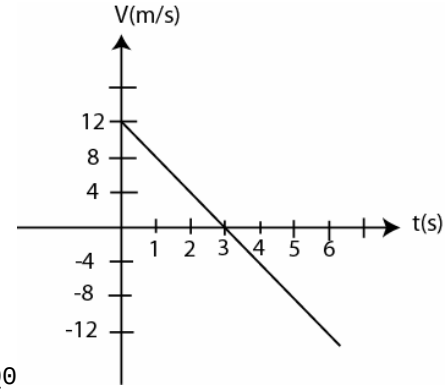
Q4 Q0 A stone is thrown vertically upward with an initial
Q0 speed of 10 m/s. What is its speed when it returns
Q0 to a height of 3.83 m above its starting point?
Q0
A1 5.0 m/s
A2 6.0 m/s
A3 4.0 m/s
A4 8.0 m/s
A5 9.8 m/s
Q0

Q5 Q0 A particle moves along the x axis. Its position from
Q0 its starting point as a function of time t is given in
Q0 Fig 2. What is the total distance that this particle
Q0 travels from t=0 to t=6.0 s?



Q0
A1 12 m
A2 4.0 m
A3 7.0 m
A4 10 m
A5 zero
Q0

Q6 Q0 A particle starts from Xo = 10 m at time to = 0. Its
Q0 velocity (v) as a function of time (t) is as shown in
Q0 Fig 1. Find the position (X) of the particle at time
Q0 t = 3.0 s.



Q0
A1 28 m
A2 10 m
A3 36 m
A4 46 m
A5 9.0 m
Q0

Q7 Q0 Two vectors are given as: A = -3.0 i + 5.0 j + 4.0 k and
Q0 B = 4.0 i + 5.0 j + 3.0 k, where i,j and k are the unit
Q0 vectors in the positive x, y and z directions.
Q0 Find the angle between the vectors A and B.
Q0
A1 60 degrees
A2 45 degrees
A3 30 degrees
A4 90 degrees
A5 0 degree

Q0
Q8 Q0 In the cross product F = v x B, take v = 2.0 i,
Q0 F = 6.0 j and the x-component of vector B equals zero.
Q0 What then is B in unit-vector notation?
Q0
A1 -3.0 k
A2 3.0 k
A3 2.0 j + 6.0 k
A4 2.0 j - 6.0 k
A5 -2.0 j + 6.0 k
Q0
Q9 Q0 Two displacement vectors A and B have equal magnitudes of
Q0 10 m. Vector A is along the +y axis and vector B makes
Q0 45 degrees counterclockwise with +x axis. Find the vector
Q0 C such that B + C = 2A .
Q0
A1 C = -7 i + 13 j
A2 C = -7 i + 3 j
A3 C = 7 i + 13 j
A4 C = 7 i + 3 j
A5 C = 7 i + 27 j
Q0

EXAM 1 – 042

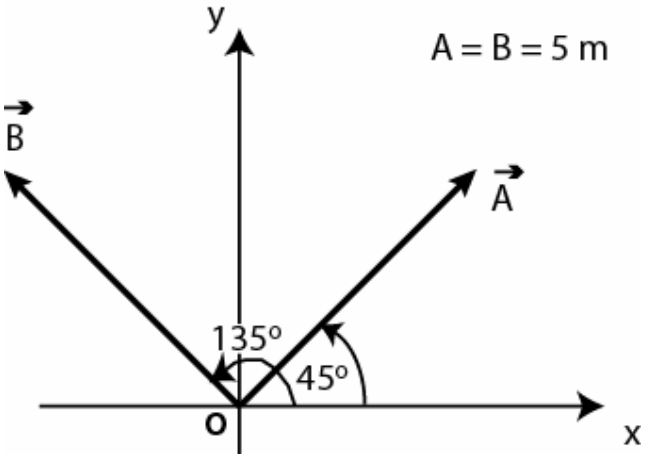
Q1 Q0 Express speed of sound, 330 m/s in miles/h.
Q0 (1 mile = 1609 m)
Q0
A1 738   miles/h
A2 330   miles/h
A3 147   miles/h
A4 0.205 miles/h
A5 980   miles/h
Q0
Q2 Q0 A cylindrical can, 6.00 inches high and 3.00 inches in diameter
Q0 is filled with water. Density of water is 1.00 g/cm**3. What is
Q0 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 Xi to Xf.
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 Xi = -4 m , Xf = 4 m
A2 Xi = -4 m , Xf = -8 m
A3 Xi = -4 m , Xf = 2 m
A4 Xi = 4 m , Xf = -2 m
A5 Xi = 4 m , Xf = 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 - 2.7*t**4

Q0 particle 2: x(t) = 3.5 + 2.7*t**3
Q0 particle 3: x(t) = 3.5 + 2.7*t**2
Q0 particle 4: x(t) = 3.5 - 3.4*t - 2.7*t**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) = 75*t - 1.0*t**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**2
A2   0 m/s**2
A3 -75 m/s**2
A4 -9.8 m/s**2
A5 100 m/s**2
Q0

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).

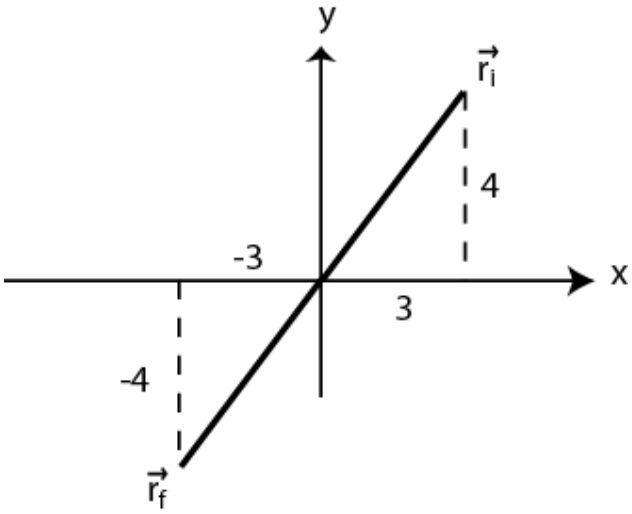


Q0
A1 magnitude = 7.1 m, theta = 90 degrees
A2 magnitude = 10 m, theta = 45 degrees
A3 magnitude = 10 m, theta = 30 degrees
A4 magnitude = 7.1 m, theta = 0 degree
A5 magnitude = 5.0 m, theta = 90 degrees
Q0

Q8 Q0 Vector A has components Ax = 4.0, Ay = -3.0.
Q0 Vector B has components Bx = 8.0, By = 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.(A X B).
Q0
A1 114
A2 7.00 i - 5.00 j
A3 30 i
A4 -114
A5 120
Q0

Q10Q0 The position of a particle is initially
Q0 ri = (3.0 m)i + (4.0 m)j, and 10 s later it
Q0 is rf = -(3.0 m)i - (4.0 m)j (see Fig 2). What is
Q0 its average velocity during this time interval?



Q0
A1 (-0.6i - 0.8j) m/s
A2 (0.6i + 0.8j) m/s
A3 0 m/s
A4 10 m/s, at angle 45 degree
A5 10 m/s, at angle -45 degree