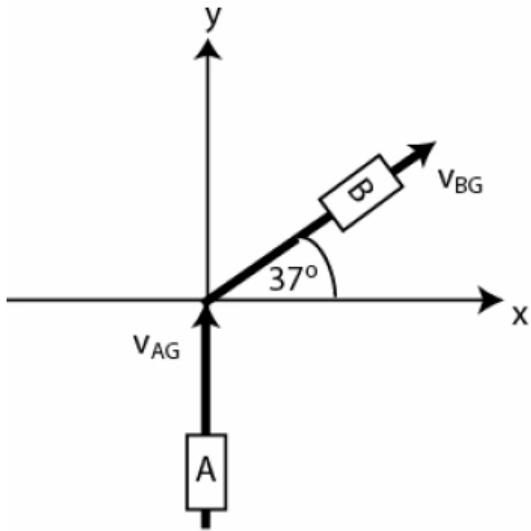Q10Q0 Car A travels with velocity (30 j) m/s (relative to
    Q0 the ground) and car B travels with speed of 50 m/s in
    Q0 a direction making an angle of 37 degrees with +x axis
    Q0 (relative to the ground) (see **Fig 9**). What is the velocity
    Q0 of car A relative to car B ?

    Q0
    A1 (-40i)   m/s
    A2 (40i+30j) m/s
    A3 (-40i-60j) m/s
    A4 (40i)   m/s
    A5 (-40i-30j) m/s
    Q0
Q11Q0 A projectile is thrown from a height H with
    Q0 a speed of 10.0 m/s at an angle of 30 degrees
    Q0 below horizontal as shown in **Fig 10**. Find H ,
    Q0 if the horizontal distance x = 20.0 m.
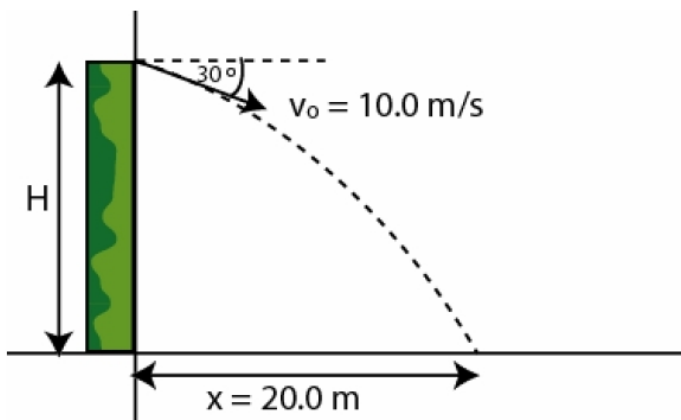
    Q0

```
      A1  37.7 m
      A2  98.0 m
      A3  49.0 m
      A4  20.0 m
      A5  67.8 m
      Q0
Q12Q0 A stone is tied to the end of a string and is rotated
   Q0 with constant speed around a horizontal circle of
   Q0 radius 1.0 m. If the magnitude of its acceleration is
   Q0 225 m/s**2, What is the period (T) of the motion?
   Q0
   A1  0.42  s
   A2  1.0   s
   A3  0.028 s
   A4  5.0   s
   A5  2.0   s
   Q0
Q13Q0 At t=0, a particle leaves the origin with a velocity
   Q0 of vo = (4i + 2j) m/s. After 20.0 s its velocity is
   Q0    v  = (20i - 4j) m/s.  Find its acceleration
   Q0 (assumed constant).
   Q0
   A1 (0.8i - 0.3j) m/s**2
   A2 (0.5i + 0.4j) m/s**2
   A3 (0.3i - 0.7j) m/s**2
   A4 (0.7i + 0.7j) m/s**2
   A5     0         m/s**2
   Q0
```
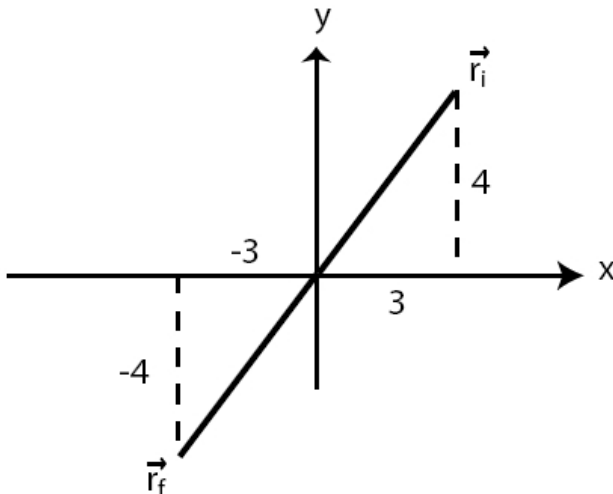
EXAM 1 – 042

```
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
```

Q0
Q11Q0 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

$v_o = 25$ m/s

37°

40 m

X
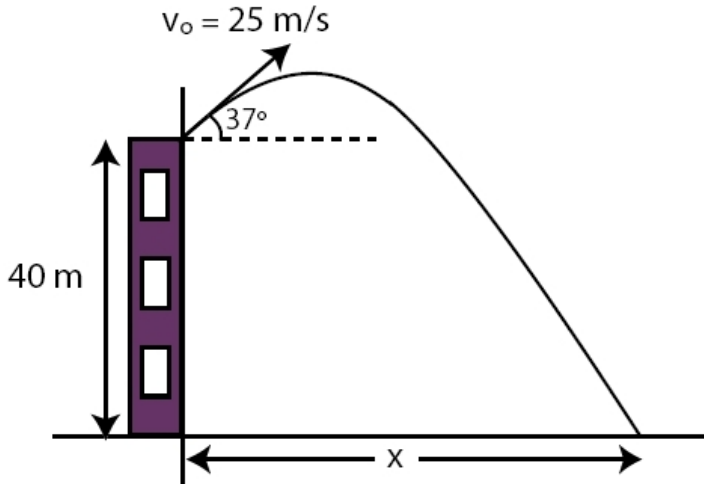
   A1 95 m
   A2 66 m
   A3 34 m
   A4 48 m
   A5 133 m
   Q0
Q12Q0 A satellite is placed in a circular orbit 8.0*10**3 km from
   Q0 the center of the earth. If it takes the satellite 2.0 hours
   Q0 to complete one revolution, what is its centripetal
   Q0 acceleration?
   Q0
   A1 6.1 m/s**2 towards the center of the earth
   A2 6.1 m/s**2 away from the center of the earth
   A3 2.4 m/s**2 toward the center of the earth
   A4 2.4 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