Assignment 3

1. What is the acceleration of the Earth toward the sun?

2. Consider a person standing on the Earth's equator.
   a) What is her/his centripetal acceleration caused by the Earth's rotation?

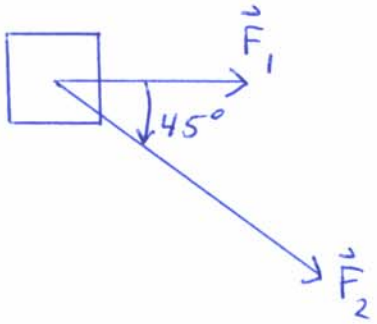
   b) How much larger/smaller is this acceleration than the gravitational acceleration?

   c) How fast would the Earth need to spin in order for the centripetal acceleration to be equal to g?

3. A wooden block, sliding along a horizontal floor is acted upon by a force of friction equal to 10% of the weight of the block. The block comes to rest from a speed of x m/sec, in 4 sec. Find x.

4. A car of mass 1.5×10^3 kg travels around a circular curve at a speed of 100 km/hr. If the radius of the curve is 75 m, calculate the centripetal force acting on the car. What exerts this centripetal force i.e. prevents the car from flying out of the curve?

5. Consider a 2 kg mass subject to forces $\vec{F}_1$ and $\vec{F}_2$ shown below.



$|\vec{F}_1| = 5$ Nt.

$|\vec{F}_2| = 8$ Nt.

   a) Find the total force vector acting on the mass.

   b) Find the magnitude of the total force vector.

   c) Find the direction of the total force vector.

   d) Find the acceleration of the mass.