Module 04 - Lesson 4

Non-uniform Circular Dynamics

Question 1: A 1200-kg car is travelling on a 300-m circular path with a radial acceleration of 2.0 m/s^2 and a tangential acceleration of 1.0 m/s^2. Calculate the magnitude of the net force acting on the car.

Question 2: A 100-g marble rotates on a 1-m circular path with an initial speed of 2 m/s. If the marble experiences a tangential acceleration of 1.2 m/s^2 find the radial and tangential components of the initial net force acting on the marble.

Problem: A car, with an initial speed of 80 km/h, comes to a full stop as it rotates on a circular track radius of 300 m. The coefficient of friction between the tires of the tired and the road is 0.20. (a) Find the magnitude of the car's tangential and radial acceleration? (b) How long will it take the car to stop?