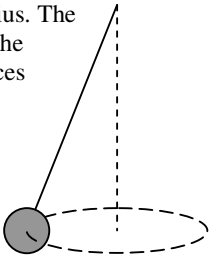


Physics worksheet – Uniform circular motion

<p>Q1a A 1200-kg car travels at 32 ms^{-1} for 3 minutes around a circular track of radius 450 m. Find the number of complete laps finished by the car.</p>	<p>Q1b Determine the acceleration of the car while it is in motion.</p>
<p>Q1c Find the magnitude of the average velocity of the car in one half of a lap.</p>	<p>Q1d Find the magnitude of the average acceleration of the car in one half of a lap.</p>
<p>Q1e Determine the centripetal force of friction on the tyres to keep the car moving around the circular track at 32 ms^{-1}.</p>	<p>Q1f The car will skid out of control if the centripetal force of friction on the tyres reaches 3200 N. Determine the speed range for safe driving.</p>
<p>Q2a A conical pendulum moves at constant speed in a horizontal circular path of 0.25-m radius. The mass of the pendulum bob is 0.25 kg and the length of the cord is 0.75 m. Show the forces on the pendulum bob.</p> 	<p>Q2b Determine the tension in the cord.</p>
<p>Q2c Calculate the acceleration of the pendulum bob.</p>	<p>Q2d Calculate the speed of the pendulum bob.</p>
<p>Q2ei The cord can support a tension up to 3 times the weight of the pendulum bob. Determine the maximum angle the cord makes with the vertical while the pendulum bob is in motion.</p>	<p>Q2eii Calculate the maximum speed of the pendulum bob.</p>