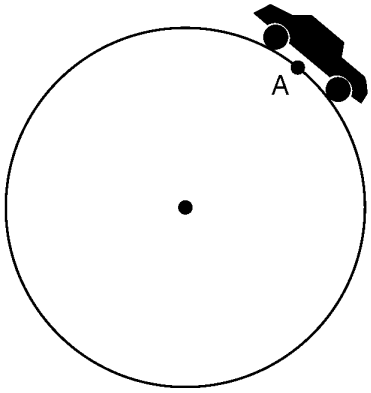
Name **Part 2 Review O**

1. A projectile has an initial horizontal velocity of 15 meters per second and an initial vertical velocity of 25 meters per second. Determine the projectile's horizontal displacement if the total time of flight is 5.0 seconds. [Neglect friction.]

Base your answers to questions **2** through **4** on the information below.

The combined mass of a race car and its driver is 600. kilograms. Traveling at constant speed, the car completes one lap around a circular track of radius 160 meters in 36 seconds.



2. Calculate the magnitude of the centripetal acceleration of the car.

3. On the diagram *above*, draw an arrow to represent the direction of the net force acting on the car when it is in position *A*.

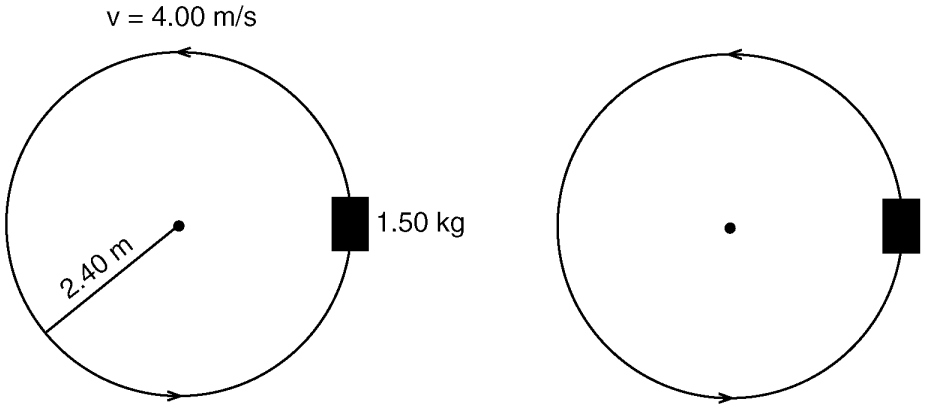
4. Calculate the speed of the car.

5. Base your answer to the following question on the information given below.

Friction provides the centripetal force that allows a car to round a circular curve. Find the minimum coefficient of friction needed between the tires and the road to allow a 1600-kilogram car to round a curve of radius 80. meters at a speed of 20. meters per second. [Show all work, including formulas and substitutions with units.]

Base your answers to questions **6** and **7** on the information and digram below.

A 1.50-kilogram cart travels in a horizontal circle of radius 2.40 meters at a constant speed of 4.00 meters per second.



6. On the blank circle above, draw an arrow to represent the direction of the acceleration of the cart in the position shown. Label the arrow *a*.

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7. Calculate the time required for the cart to make one complete revolution. [Show all work, including the equation and substitution with units.]