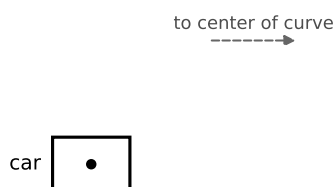


Part A: What Provides the Centripetal Force?

1. For each object moving in a circle, name the real force that points toward the center and acts as the centripetal force.
 - a. A tetherball whipping around its pole on a rope
 - b. A car turning a corner on a flat, dry road
 - c. A weather satellite orbiting Earth
 - d. Wet clothes pressed against the wall of a washing machine during the spin cycle

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2. A car turns right on a flat road at a steady speed. The box shows the car seen from behind.



- a. Draw a free-body diagram showing every force on the car. Label each force.
 - b. Jordan adds a fourth arrow labeled F_c pointing toward the center. Explain why that is a mistake.

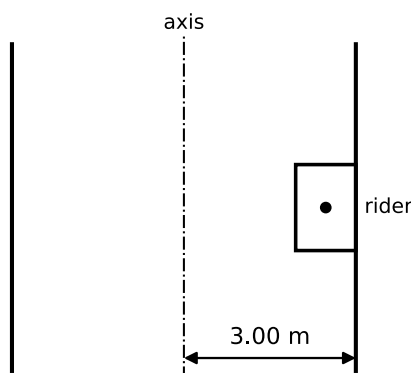
Part B: Calculations

Use $F_c = mv^2/r$. Name the real force first, then show your knowns, equation, substitution, and answer with units.

3. Kenji swings a 0.250 kg ball on a string in a horizontal circle of radius 0.800 m at 4.00 m/s. What is the tension in the string? (Ignore gravity's small effect on the string.)

4. The tires of a 1,200 kg car can supply at most 9,000 N of static friction on a flat curve of radius 60.0 m.
- What is the fastest the car can safely take the curve?
 - What happens to the car if it goes faster than this? Describe its path.

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5. A 50.0 kg rider stands against the wall of a rotor ride. The wall is 3.00 m from the axis, and the rider moves at 6.00 m/s. The floor drops away.



- Draw a free-body diagram for the rider on the picture.
- Find the normal force from the wall on the rider.
- How much friction must the wall supply to keep the rider from sliding down? Use $g = 9.8 \text{ m/s}^2$.