

Circular Motion

Physics

Why circular motion requires a force, and where it points.

Centripetal acceleration points toward the centre and has magnitude v^2 over r .

$$a = v^2/r = \omega^2 r \cdot F = mv^2/r$$

Car on a bend Friction provides the centripetal force

Satellite in orbit Gravity provides it

Ball on a string Tension provides it

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✗ **Adding a 'centrifugal force' to the diagram**

✓ **There is no outward force**

Centrifugal force is an artefact of a rotating frame. In an inertial frame the only force is centripetal, pointing inward.

Centripetal force is not a new force. It is the name for whatever real force happens to be pointing at the centre.