

Centripetal Force

According to Newton's 2nd Law, the acceleration of an object is caused by an unbalanced force acting in the direction of the acceleration.

If an object is moving in circular motion it is accelerating and thus must have an unbalanced force causing this acceleration.

Centripetal Force

Centripetal force, F_c , is the force causing centripetal acceleration. F_c is directed towards the center of the circle.

Using Newton's 2nd Law: $F = ma$

$$F_c = ma_c$$

Any of the a_c formulas can be plugged into this equation to find F_c :

$$F_c = ma_c$$

$$F_c = \frac{mv_t^2}{r} = \frac{m4\pi^2r}{T^2} = m4\pi^2rf^2$$

ex.

A 1000 kg car enters a level curve at 20 m/s. If the curve has a radius of 80 m, what is the centripetal force causing the a_c ?

What force causes the centripetal force in the previous question?
(Centripetal force is just a label describing some force that is causing an object to move in circular motion.)

Centrifugal Effect

Objects want to stay in constant motion in a straight line because of inertia. When moving in circular motion, the feeling of being thrown or pushed to the outside of the circle is called centrifugal effect. This feeling originates from wanting to keep moving at a constant velocity in a straight line.