

Vertical Circular Motion

In a vertical circle, the motion is non-uniform (but can be uniform).

- If tension is constant, then speed varies.
- If speed is constant (UCM), then tension varies.

The sum of the forces is the centripetal force.
(The gravitational force + the normal force or tension force.)

At the **top** of the circle:

At the **bottom** of the circle:

ex.

A mass on the end of a string is whirled in a **horizontal** circle of radius 0.5 m at a speed of 3 m/s. If the mass is 0.25 kg, find the tension in the string.

The same mass is now whirled in a **vertical** circle and the mass is continuing to move in uniform circular motion with a velocity of 3 m/s.

Find the tension at the top of the circle.

Find the tension at the bottom of the circle.