A particle is said to be in uniform circular motion if it travels in a circle (or arc) with constant speed \( v \). Centripetal means centre-seeking.

The magnitude of the velocity of the particle in Figure 6.1 is not changing, but its direction IS. Therefore, there is an acceleration, even though the speed is not changing!

The direction of the acceleration is given by:
\[
\Delta v = v_2 - v_1 = v_2 + (-v_1)
\]
The direction of the acceleration is toward the center of the circle.

The equation for the centripetal acceleration is:
\[
a_c = \frac{v^2}{r}
\]

The equation for the centripetal force is:
\[
F_c = ma_c
\]
\[
F = \frac{mv^2}{r}
\]
The centripetal force is the net force of an object in circular motion.
\[
F_c = F_{net}
\]