

$$F_c = \frac{mv^2}{r}$$

Circular Motion Tip Sheet

Centripetal Acceleration Formula

$$a_c = \frac{v^2}{r}$$

F_c = centripetal force (newtons)

m = mass in kg

v = velocity in m/s

r = radius in m

Vertical circles

$$\text{Tension @ top} = F_c - F_w$$

$$\text{Tension @ bottom} = F_c + F_w$$

Around a level curve with friction

$$u = v^2 / (rg)$$

F_c must equal F_f and $F_n = F_w$

Loop the Loop

F_c at the top must equal F_w

Around a banked curve with friction

$$F_c = F_f + F_p$$