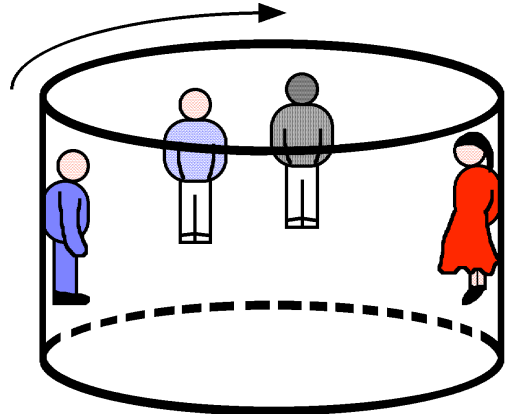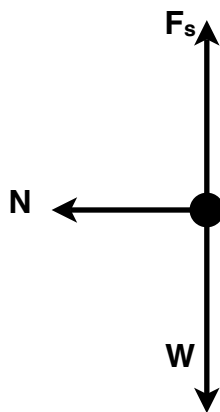# Rotor

You enter the carnival ride called "The Rotor". The circular room is spinning and you and other riders are stuck to the circular wall.

- Draw a free-body diagram of the woman in red

- Is she in equilibrium? Explain

- What force is providing the centripetal force?

Solution:

(a) Free-body diagram:

(b) She is not in equilibrium: there is a net force on her towards the centre of the rotor

(c) The centripetal force is provided by the normal force of the wall pushing on her.

In fact, if we guess that $\mu_s \sim 0.5$ for rubber + clothes, then balancing vertical forces (no acceleration in vertical direction) we get

$$F_s = \mu_s N = W$$

so

$$N = W/\mu_s \sim 2W$$

i.e. the rider's *apparent* weight is about twice their normal weight.