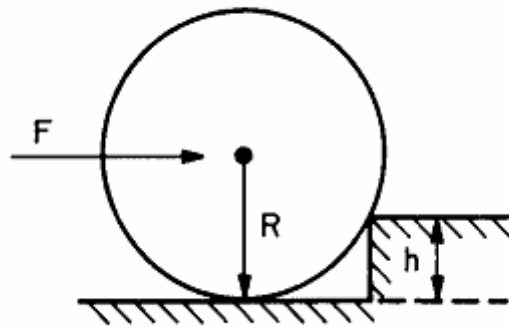


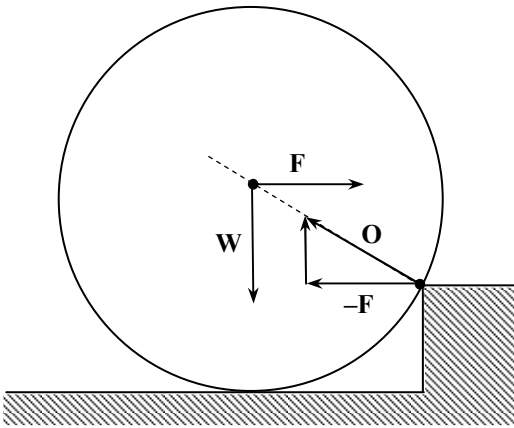
wheel and block



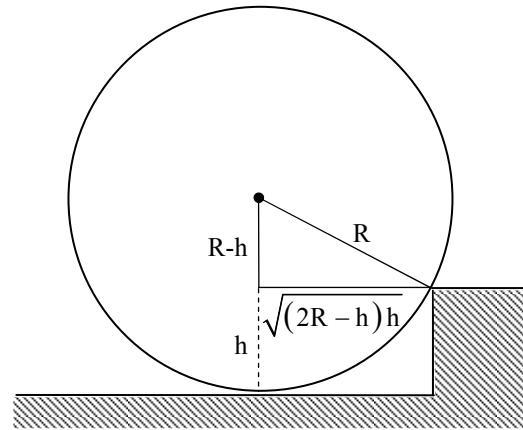
What horizontal force F (applied at the axle) is required to push a wheel of weight W and radius R over a block of height h ?

Michael A. Gottlieb's Solution (using forces)

Imagine pushing on the axle with a horizontal force F that is slowly increasing in magnitude from 0. F induces a reaction force O at the corner of the block where it meets the wheel.



While the wheel is not moving, the horizontal component of O must equal and oppose F . When the magnitude of the vertical component of O equals the weight of the wheel, it will be lifted.



By similar triangles we find

$$\frac{F}{W} = \frac{\sqrt{(2R-h)h}}{R-h}$$