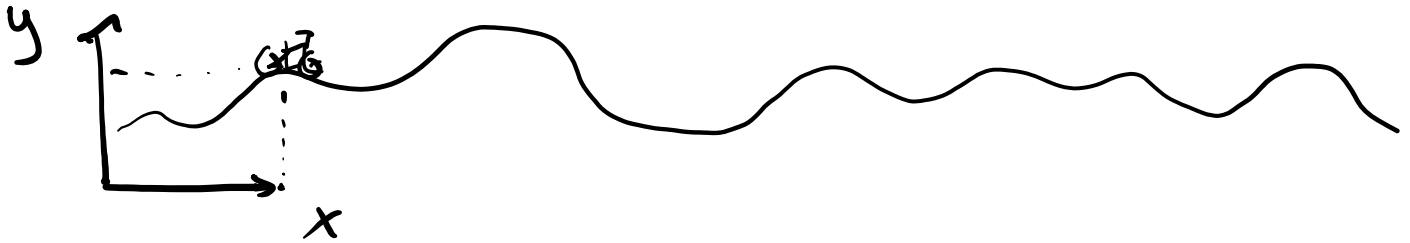


Electric Bicycle Over 2D profile

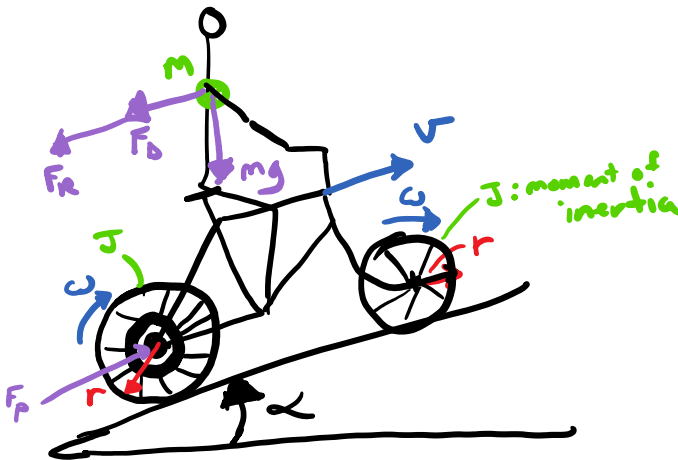
Question: How much power required to traverse elevation profile?



Assumptions

- unlimited power battery (ignore battery)
- motor DC wound motor
- bicycle+rider is a particle (no bicycle pitch moments)
- no slip rolling of wheels on the ground
- bicycle can't leave the ground

FBD



$$F_D = \frac{1}{2} \rho A v^2$$

↑
air density / frontal area

$$F_R = C_R F_N$$

↑
coeff. of rolling resistance

↑
normal force