# ROLLER COASTER → CALCULATIONS

- Theoretical:

(2) $E_g = E_{kft}$

$m a_g h_i = \frac{1}{2} m v_{ft}^2 \Rightarrow v_{ft} = \sqrt{2 a_g h_i}$

(5) $v_f = \sqrt{2 a_g(x) h_i}$, $x = 2, 3, 4$

↳ theoretical velocity

- Energy lost due to friction (Work):

(8) $E_{gi} = E_{kfa} + E_{thermal}$

$m a_g h_i = \frac{1}{2} m v_{fa}^2 + E_{thermal}$

$E_{thermal} = m a_g h_i - \frac{1}{2} m v_{fa}^2$

↳ actual velocity calculated