Falling weight & pulley...

- For the hanging mass use $\Sigma F = ma$

  ➔ $mg - T = ma$

- For the flywheel use $\Sigma\tau = I\alpha$

  ➔ $TR\sin(90) = I\alpha$

- Realize that $a = \alpha R$

  ➡ $TR = I\frac{a}{R}$

- Now solve for a, eliminate T:

$$a = \left(\frac{mR^2}{mR^2 + I}\right)g$$