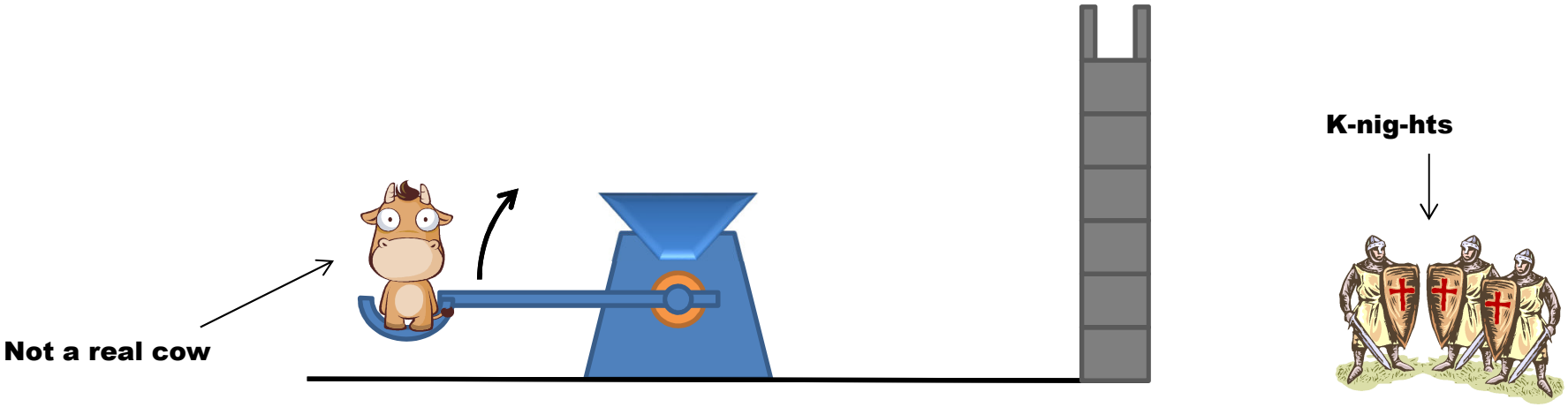
How many difference sources of torque are acting on Mark's top?

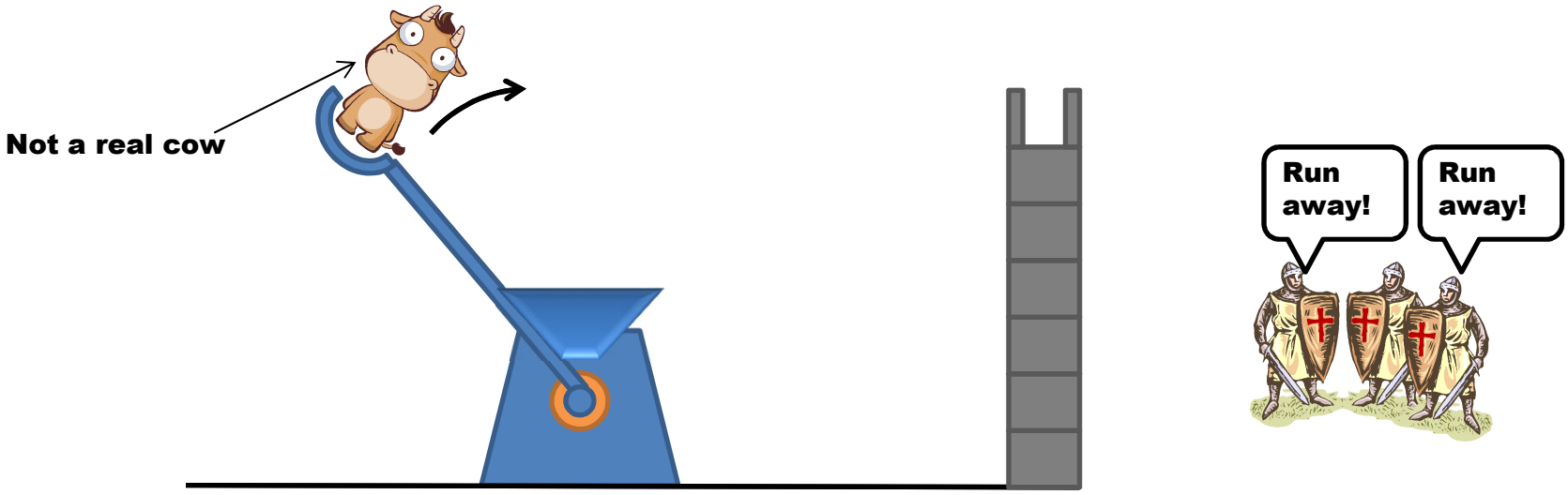
A) 0
B) 1
C) 2
D) 3
E) 4



During the fictional defence of a French castle, a constant torque **τ** is exerted for a time **t** on a catapult arm loaded with a cow. If the arm was initially stationary, and the moment of inertia of the cow plus arm about the axis is **I**, the angular velocity of the arm after time t will be

A) $t\,\tau / I$
B) $t\,I / \tau$
C) $\tau\,I / t$
D) $\tau / (I\,t)$
E) I have no idea how to do this. Please take this question away or I shall taunt you a second time.

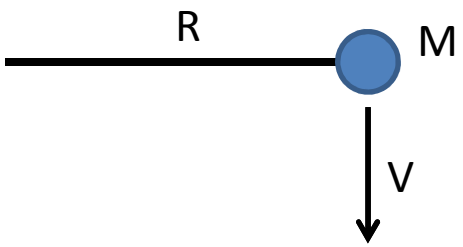
Extra: if the arm stops at this point, with what speed will the cow fly off?



If the catapult arm (length R) plus cow are rotating about the axis at angular velocity ω just before the arm stops, with what speed does the cow fly off?

A) ω
B) ω R
C) ω / R
D) ω / $\sqrt{2}$
E) None of the above

Extra: in terms of the mass M, the radius R, and the speed v, what is the angular momentum of the cow about the axis just after it leaves the catapult?



A ball of mass M revolves in a circular path on the end of a string. Using $L = I \omega$, calculate the angular momentum of the ball in terms of M, V, and R.

Which configuration has the largest angular acceleration?