Answer on Question #73347-Physics-Other

A skater spins with an angular speed of 17.9 rad/s with his arms outstretched. He lowers his arms, decreasing his moment of in- ertia from 41 kg·m2 to 36 kg·m2.

a) Calculate his initial rotational kinetic energy.

Answer in units of J.

b) Calculate his final rotational kinetic energy.

Answer in units of J.

Solution

a) His initial rotational kinetic energy is

$$E_i = \frac{1}{2} I \omega_i^2 = \frac{1}{2}(41)(17.9\,)^2 = 6570\,J.$$

b)

His initial rotational kinetic energy is

$$E_f = \frac{1}{2} I \omega_f^2 = \frac{1}{2}(36)(17.9\,)^2 = 5770\,J.$$