

Planet Holloway - **Websheet 8.2**

AP Physics C - Chapter 8 Torque

You may print this out and write on it or work on your own paper.

Show all work.

Assume: ($g_{\text{earth}} = 10 \text{ m/s/s}$), (ccw = counter clockwise)

1. A penguin who weighs 60 N stands on a 4 m board that weighs 12 N. The board is supported at each end. The support on the left is 4 times that of the right. How far from the left is the penguin?
2. An 85 kg man is two-thirds the way up a an 8 m ladder that rests against a smooth wall (smooth means no friction) and has a mass of 25 kg and makes an angle with the ground of 50° . Find the force of friction on the ground.
3. A meter stick has is balanced horizontally on a pencil lying on the table (like a see-saw) If I place a 200 g mass and a 400 g mass at 40 cm and 30 cm respectively, where should I place a third mass of 500 g such that the meter stick is balanced again ?
- 4 A massless rod of 0.6 meters has a 300 g mass at one end and a 500 g mass at the other. What is the rods moment of inertia if rotated about the middle (like a propeller)?
5. A fan with a moment of inertia of $0.68 \text{ kg}\cdot\text{m}^2$ has a net torque of $0.3 \text{ m}\cdot\text{N}$ applied to it. How many rotations does the fan go through in 7 seconds if it starts from rest?
6. An 1.7 kg aluminum disk with a moment of inertia of $0.26 \text{ kg}\cdot\text{m}^2$ is rotating at a constant 6.8 rad/s . If the radius of the disk is 55.3 cm, what average frictional torque must be applied to stop the disk in exactly 14 seconds?

1. 0.56 m

4. $0.072 \text{ kg}\cdot\text{m}^2$

2. 580.4 N

5. 1.72 rotations

3. 70 cm

6. $-0.126 \text{ m}\cdot\text{N}$