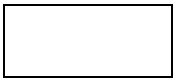
Rotational Dynamics and Torque: Chapter 9.1 – 9.3

Torque (τ) – cause of rotational acceleration

Torque = force x length of leverarm



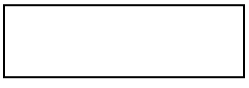
(Torque is a force, so it produces rotational acceleration.)

ex. Find the torque on a bolt if a 700 N force is exerted on a wrench at a distance of 30 cm from the bolt (axis of rotation).

- fig. 9.2 on p. 241

Direction:
Torque is + if counterclockwise rotation
Torque is – if clockwise rotation

If the applied force makes an angle with the length of the device applying the torque, the torque is found by:



Centre of Gravity:

the point of application of the force of gravity on an object

- fig. 9.9 and 9.10 on p. 247

ex. Find the net torque.

Where should B be placed for the net torque to be zero?

Equilibrium

Translational motion – motion in parallel paths (no rotation)

Translational Equilibrium – when acceleration is zero in translational motion

Rotational Equilibrium – when rotational acceleration is zero

- example 4 on p. 244