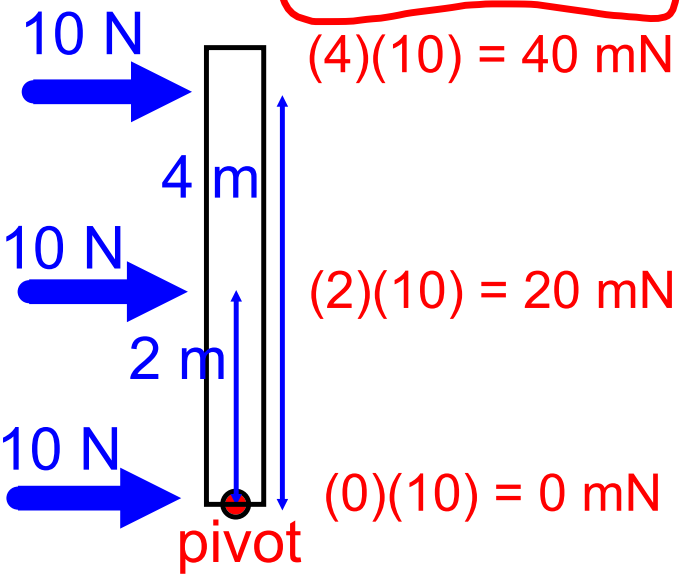
PIVOT POINT

Fixed point about which the object rotates. If there is no fixed point, the Center of Mass becomes the pivot.

TORQUE Rotational equivalent of force.

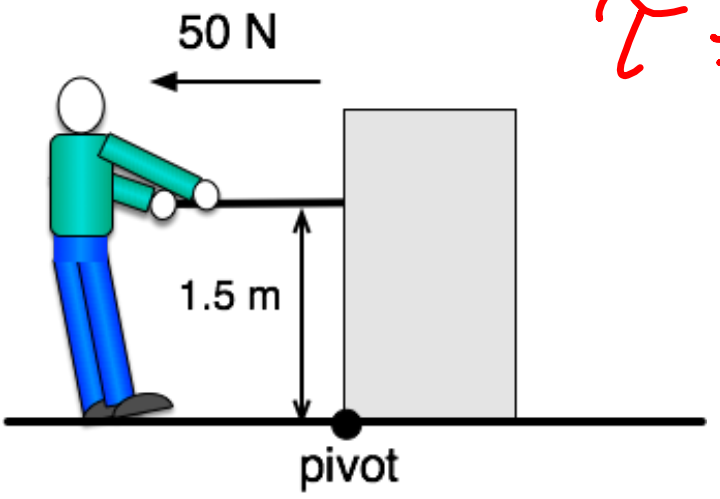
$\tau = r F$

Farther from the pivot = more Torque



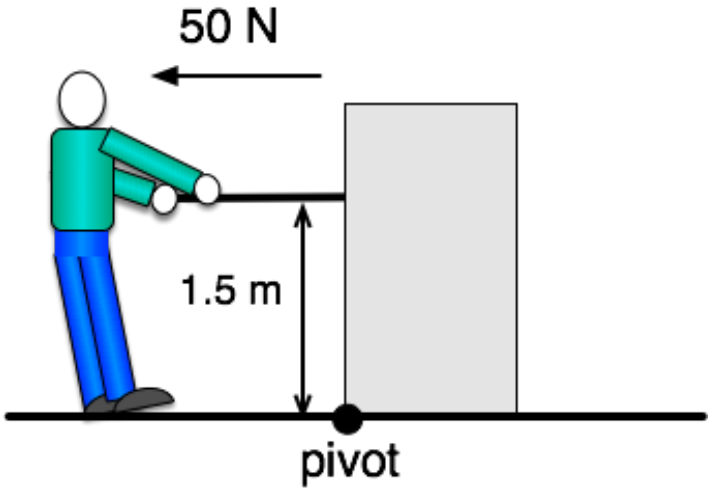
Forces at pivot = no Torque

Calculate the Torque; include direction



$\tau = rF$

Calculate the Torque; include direction

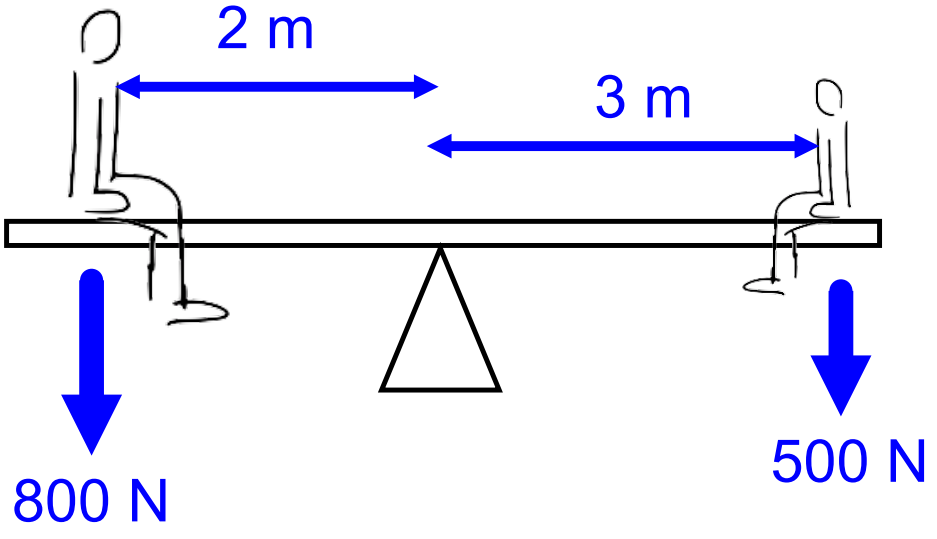


τ = (1.5 m)(50 N)

= 75 mN, CCW

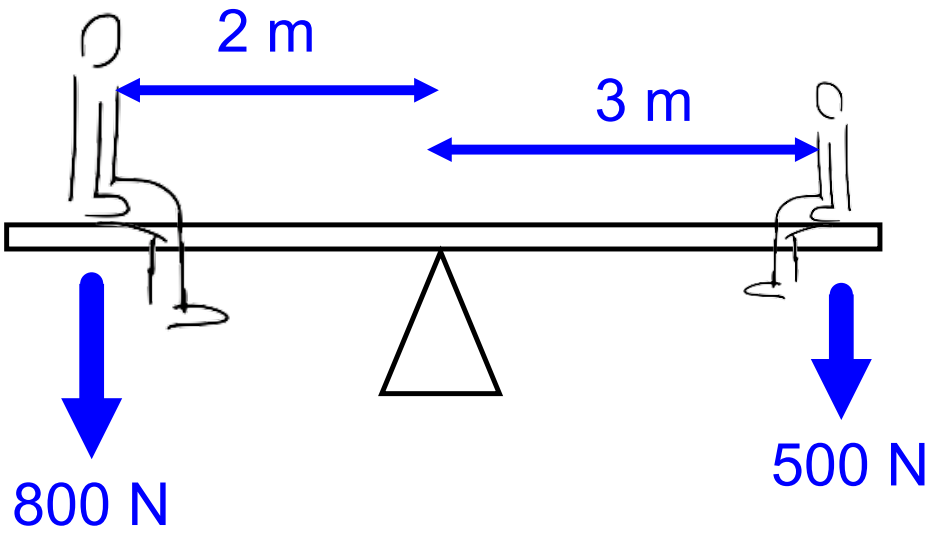
NET TORQUE

Net Torque = Torques CCW - Torques CW



NET TORQUE

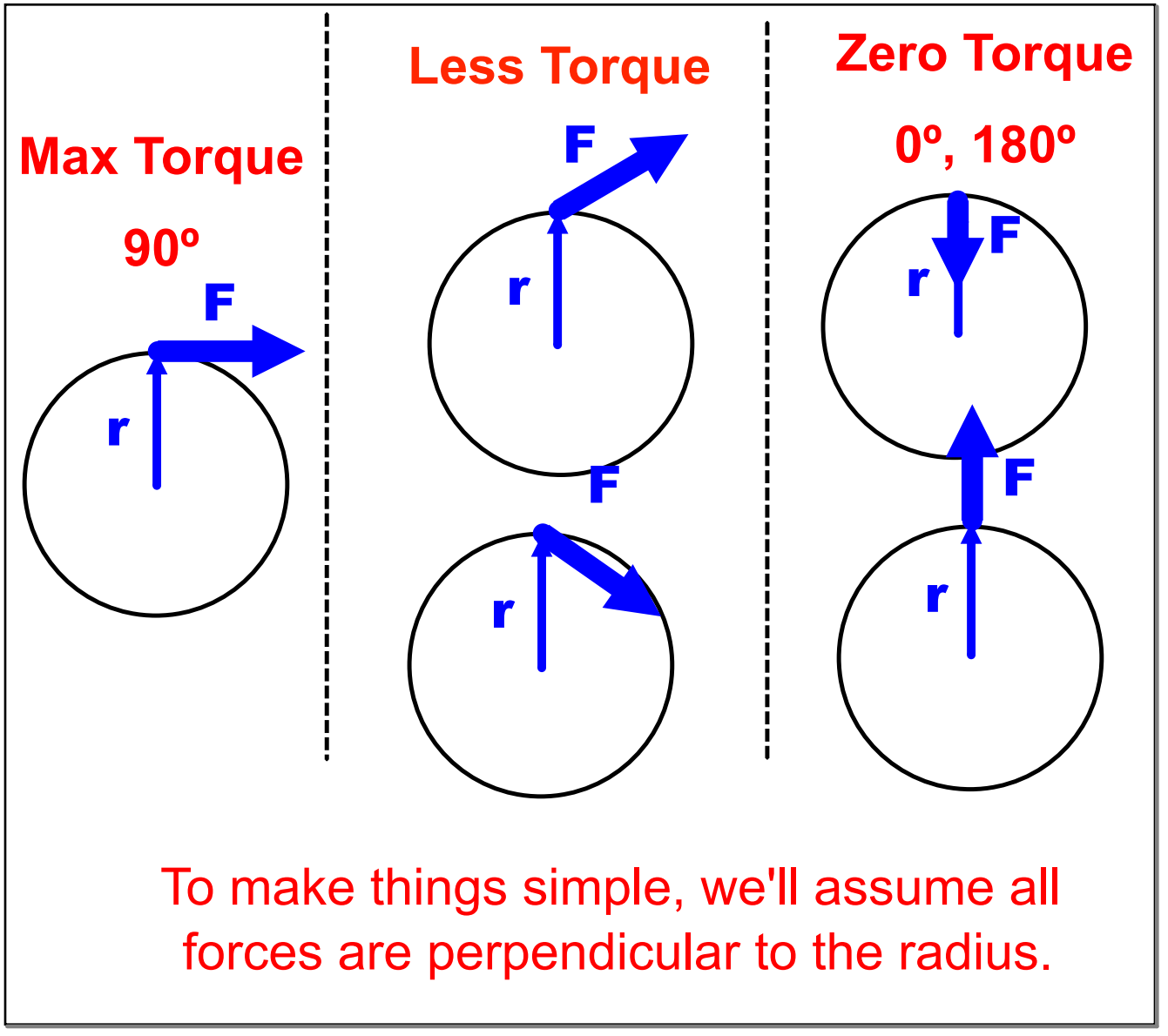
Net Torque = Torques CCW - Torques CW



τ = (2 m)(800 N)
= 1600 mN, CCW

τ = (3 m)(500 N)
= 1500 mN, CW

τ_{net} = 100 mN, CCW


Max Torque
90º
F
r
Less Torque
F
r
F
r
Zero Torque
0º, 180º
F
r
F
r
To make things simple, we'll assume all forces are perpendicular to the radius.

3rd Law of Motion

If one objects pushes/pulls on another, the other pushes/pulls back with an identical force in the opposite direction.

3rd Law of Motion for Rotational

If one objects torques another, the other object torques back equally but in the opposite direction.