# Torque #2

τ = _F d_   **Torque Net: Torque (left) = Torque (right)**

1. Ned tightens a bolt in his car engine by exerting 12 N of force on his wrench at a distance of 0.40m from the fulcrum. How much torque must Ned produce to turn the bolt?

2. Mabel and Maude are seesawing on the school playground and decide to see if they can move to the correct location to make the seesaw balance. Mabel weighs 400. N and she sits 2.00m from the fulcrum of the seesaw. Where should 450.-N Maude sit to balance the seesaw?

3. A water faucet is turned on when a force of 2.0 N is exerted on the handle, at a distance of 0.060m from the pivot point. How much torque must be produced to turn the handle?

4. Nancy, whose mass is 60.0 kg, is working at a construction site and she sits down for a bite to eat at noon. If Nancy sits on the very end of a 3.00-m-long plank pivoted in the middle on a sawhorse, how much torque must her co-worker provide on the other end of the plank in order to keep Nancy from falling to the ground?

7.Most door knobs are placed on the side of the door opposite the hinges instead of in the center of the door. a) Why is this so? b) if a torque of 1.2 N·m is required to open a door, how much force must be exerted on a doorknob 0.76 m from the hinges compared to a doorknob in the middle of the door, 0.38 m from the hinges.

8. Priscilla is working out in the gym with a 2.00-kg mass that she holds in one hand and gradually lifts up and down. a) Will Priscilla find it easier to lift the mass if she pivots her arm at the shoulder or at the elbow? b) If Priscilla's arm is 0.60 m long from her shoulder to her palm and 0.28 m long from her elbow to her palm, how much torque must she produce in each case to lift the weight?

9. A man needs to loosen a bolt on a tire. He applies 35.5 N of perpendicular force on a wrench that is 0.425 m long. How much torque is he applying?

10. 30 Newton•meters of torque is required to close a door 1.2 meters wide. What force is needed to cause this torque?

11. How many meters is Person B from the pivot point?
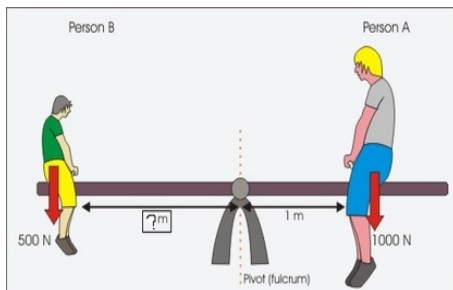
ANSWER BANK:

| .5 | .12 | 25 | 1.78 | 882 | 2 |

| 4.8 | 1.6 | 11.77 | 15.09 | 5.49 | 3.2 | 1765.8 |

| 2.25 | 1.2 | .04 |