Torque Homework Answers

1. a. Calculate the torque produced by a 75-N perpendicular force at the end of a 0.2-m long wrench. 15 N

b. Calculate the torque produced by the same 75-N force when a pipe extends the length of the wrench to 0.5 m. 37.5 N

2. Two children are sitting on a see-saw, as shown. Calculate the distance the 500-N child should sit from the fulcrum (pivot) to balance the see-saw. 1.8 m

3. Suppose that a meterstick is supported at the center, and a 20-N block is hung at the 80-cm mark. Another block of unknown weight just balances the system when it is hung at the 10-cm mark. What is the weight of the second block? 15 N
4. What is the mass of the rock shown in the figure? 1.33 kg

5. What is the mass of the meterstick shown in the figure? 1.0 kg

6. If the torque required to loosen a nut on the wheel of a car has a magnitude of 40.0 N-m, what minimum force must be exerted by a mechanic at the end of a 0.30-m wrench to loosen the nut? 133.3 N

7. A window washer is standing on a scaffold supported by vertical ropes at each end. The scaffold weighs 150 N and is 5.00 m long. What is the tension in each rope when the 600 N worker stands 1.2 m from one end? 531 N and 219 N