

Name: \_\_\_\_\_

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**Chapter 5.4 Homework**  
**Conceptual Physics**

Parent Signature: \_\_\_\_\_

**Reviewing Concepts**

*Each question is worth 1 point.*

20. How are torque and force similar? How are they different?
21. Which two quantities determine the torque on an object?
22. In what units is torque measured? Do these units have the same meaning as they do when measuring work? Explain.
23. Why is it easier to loosen a bolt with a long-handled wrench than with a short-handled one?
24. In which of the following cases would a force cause the greatest torque on the shovel? **Why?**
- a. You press straight down on the shovel so it stays straight up and down.
  - b. You twist the shovel like a screwdriver.
  - c. You push to the right on the shovel's handle so it tilts towards the ground.
25. What does it mean to say an object is in rotational equilibrium?

### **Solving Problems**

*Each question is worth 1 point.*

11. You push down on a lever with a force of 30 newtons at a distance of 2 m from its fulcrum. What is the torque on the lever?

12. You use a wrench to loosen a bolt. It finally turns when you apply 300 N of force at a distance of 0.2 m from the center of the bolt. What torque did you apply?

13. A rusty bolt requires 200 N•m of torque to loosen it. If you can exert a maximum force of 400 N, how long a wrench do you need?

14. Look at the figure of the seesaw on page 130. Calculate the net torque on the see-saw.

15. You and your cousin sit on a seesaw (as pictured in figure on page 130. You sit at 0.5 m from the fulcrum, and your cousin sits 1.5 m from the fulcrum. You weigh 600 N. How much does your cousin weigh?