Name _____ Class _____ Date _____

Assessment

Circular Motion and Gravitation

Section Quiz: Torque and Simple Machines

Write the letter of the correct answer in the space provided.

_____ **1.** What is a measure of the ability of a force to rotate or accelerate an object around an axis?
- **a.** centripetal force
- **b.** lever arm
- **c.** axis of rotation
- **d.** torque

_____ **2.** Which of the following statements is correct?
- **a.** The closer the force is to the axis of rotation, the less torque is produced.
- **b.** The closer the force is to the axis of rotation, the easier it is to rotate the object.
- **c.** The farther the force is from the axis of rotation, the harder it is to rotate the object.
- **d.** The farther the force is from the axis of rotation, the less torque is produced.

_____ **3.** Where should you push on a door to apply the most torque when opening the door?
- **a.** close to the top of the door
- **b.** close to the bottom of the door
- **c.** close to the hinges of the door
- **d.** far from the hinges of the door

_____ **4.** Wrench A is 12 cm long and wrench B is 24 cm long. For a given input force, how does the maximum torque of wrench A compare to the maximum torque of wrench B?
- **a.** 1/4 as great
- **b.** 1/2 as great
- **c.** the same
- **d.** 2 times as great

_____ **5.** Using a machine can allow you to
- **a.** do less work to perform a given task.
- **b.** use less force to do a given amount of work.
- **c.** decrease both the input force and input distance required to do work.
- **d.** increase both the input force and input distance required to do work.

_____ **6.** What kind of simple machine is like two inclined planes placed back-to-back?

a. a lever
b. a screw
c. a wedge
d. a wheel and axle

_____ **7.** What does mechanical advantage measure?

a. the ratio of input force to output force
b. the ratio of output force to input force
c. the ratio of work input to work output
d. the ratio of work output to work input

_____ **8.** What does efficiency measure?

a. the ratio of input force to output force
b. the ratio of output force to input force
c. the ratio of work input to work output
d. the ratio of work output to work input

9. Explain why no real machine can have an efficiency of 100%.

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10. An 85 kg man and his 35 kg daughter are sitting on opposite ends of a 3.00 m see-saw. The see-saw is anchored in the center. If the daughter sits 0.20 m from the left end, how far from the right end would the father have to sit for the see-saw to be in balance? ($g = -9.81$ m/s^2)