

Name _____ Per _____



Loyalty to petrified opinion never yet broke a chain or freed a human soul. -- Mark Twain

1. The blade on a table saw spins at 3450 rpm. Its diameter is 25.0 cm. What is the speed of a tooth on the edge of the blade in m/s?

2. Your roommate is working on his bicycle and has the bike upside down. He spins the 60. cm diameter wheel and you notice that a pebble stuck in the tread goes by three times every second. What is the pebble's angular speed?

3. The centers of a 10. kg lead ball and a 100. g lead ball are separated by 10. cm.
 - (a) What gravitational force does each exert on the other?

 - (b) What is the ratio of this gravitational force to the weight of the 100. g ball on Earth?

4. The free-fall acceleration at the surface of planet 1 is $20. \text{ m/s}^2$. The radius and the mass of planet 2 are twice those of planet 1. What is the free-fall acceleration on planet 2?
5. Suppose we could shrink Earth without changing its mass. At what fraction of its current radius would the free-fall acceleration at the surface be three times its present value?
6. A computer hard disk starts from rest, then speeds up with an angular acceleration of 190 rad/s^2 . Until it reaches its final angular speed of 7200 rpm . How many revolutions has the disk made 10.0 s after it starts up?

7. A space station is designed to simulate gravity by spinning at a constant angular velocity. The plan is for the station to simulate half of Earth's gravitational force by spinning at 5.0 rpm. What radius does the station need to have?

8. A 1 250 kg car is traveling at a constant speed and makes a turn with a radius of 350.0 m. Its speed is 45.0 m/s. Find the minimum coefficient of friction needed to keep the car traveling along the path.