1. Question Details SerCP9 7.P.004.soln. [1588402]

A potter's wheel moves uniformly from rest to an angular speed of 0.25 rev/s in 28.0 s.

(a) Find its angular acceleration in radians per second per second.

_____ rad/s^2

(b) Would doubling the angular acceleration during the given period have doubled final angular speed?

- Yes
- No

2. Question Details SerCP9 7.P.010.soln. [1588650]

The tub of a washer goes into its spin-dry cycle, starting from rest and reaching an angular speed of 7.0 rev/s in 7.0 s. At this point, the person doing the laundry opens the lid, and a safety switch turns off the washer. The tub slows to rest in 15.0 s. Through how many revolutions does the tub turn during this 22-s interval? Assume constant angular acceleration while it is starting and stopping.

_____ rev

3. Question Details SerCP9 7.P.014. [1589201]

An electric motor rotating a workshop grinding wheel at a rate of 1.10×10^2 rev/min is switched off. Assume the wheel has a constant negative angular acceleration of magnitude 1.80 rad/s^2.

(a) How long does it take for the grinding wheel to stop?

_____ s

(b) Through how many radians has the wheel turned during the interval found in (a)?

_____ rad

4. Question Details SerCP9 7.P.016. [1588965]

It has been suggested that rotating cylinders about 9.0 mi long and 3.5 mi in diameter be placed in space and used as colonies. What angular speed must such a cylinder have so that the centripetal acceleration at its surface equals the free-fall acceleration on Earth?

_____ rad/s

5. Question Details SerCP9 7.P.020. [1588779]

A coin rests 13.6 cm from the center of a turntable. The coefficient of static friction between the coin and turntable surface is 0.350. The turntable starts from rest at $t = 0$ and rotates with a constant angular acceleration of 0.866 rad/s^2.

(a) Once the turntable starts to rotate, what force causes the centripetal acceleration when the coin is stationary relative to the turntable? Under what condition does the coin begin to move relative to the turntable?

(b) After what period of time will the coin start to slip on the turntable?

_____ s

6. Question Details SerCP9 7.P.038. [1588877]

Use the data of this table to find the point between Saturn and the Sun at which an object can be placed so that the net gravitational force exerted by Saturn and Sun on this object is zero.

_____ m from the center of Saturn

7. Question Details SerCP9 7.P.042. [1678103]

An artificial satellite circling the Earth completes each orbit in 141 minutes. (The radius of the Earth is 6.38×10^6 m. The mass of the Earth is 5.98×10^{24} kg.)

(a) Find the altitude of the satellite.

_____ m

(b) What is the value of g at the location of this satellite?

_____ m/s^2

8. Question Details SerCP9 7.P.048.soln. [1588784]

Neutron stars are extremely dense objects that are formed from the remnants of supernova explosions. Many rotate very rapidly. Suppose the mass of a certain spherical neutron star is twice the mass of the Sun and its radius is 11.0 km. Determine the greatest possible angular speed the neutron star can have so that the matter at its surface on the equator is just held in orbit by the gravitational force. (The mass of the Sun is 1.99×10^{30} kg.)

_____ rad/s

9. Question Details SerCP9 7.P.052. [1588890]

A car rounds a banked curve where the radius of curvature of the road is R, the banking angle is θ, and the coefficient of static friction is μ.

(a) Determine the range of speeds the car can have without slipping up or down the road. (Use any variable or symbol stated above along with the following as necessary: g.)

v_{min} =

v_{max} =

(b) What is the range of speeds possible if R = 150 m, θ = 10°, and μ = 0.11 (slippery conditions)?

minimum speed ☐ m/s

maximum speed ☐ m/s

10. Question Details SerCP9 7.P.022.MI.FB. [1678133]

A 39.0-kg child swings in a swing supported by two chains, each 3.04 m long. The tension in each chain at the lowest point is 440 N.

(a) Find the child's speed at the lowest point.

☐ m/s

(b) Find the force exerted by the seat on the child at the lowest point. (Ignore the mass of the seat.)

☐ N (upward)

Assignment Details

Name (AID): **Homework #7 - Due Monday Nov. 3, 2014**
Submissions Allowed: **5**
Category: **Homework**
Code:
Locked: **No**
Author: **Segre, Phil (** psegre@physics.emory.edu **)**
Last Saved:
Permission: **Protected**
Randomization: **Person**
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