This print-out should have 14 questions. Multiple-choice questions may continue on the next column or page – find all choices before answering.

Holt SF 07A 03
001 10.0 points

A car on a Ferris wheel has an angular displacement of $\frac{\pi}{4}$ rad, which corresponds to an arc length of 24.7 m.

What is the Ferris wheel's radius?

Answer in meters.

Angular Speed of a Record
002 (part 1 of 2) 10.0 points

A record has an angular speed of 44.2 rev/min.

What is its angular speed?

Answer in rad/s.

003 (part 2 of 2) 10.0 points

Through what angle does it rotate in 0.68 s?

Answer in radians.

Circular Race Track 03
004 (part 1 of 2) 10.0 points

A racing car travels on a circular track of radius 384 m, moving with a constant linear speed of 65.3 m/s.

Find its angular speed.

Correct answer: 0.170052 rad/s.

005 (part 2 of 2) 10.0 points

Find the magnitude of its acceleration.

Correct answer: 11.1044 m/s^2.

Rotating Wheel 04
006 (part 1 of 2) 10.0 points

A wheel starts from rest and rotates with constant angular acceleration to an angular speed of 15.9 rad/s in 2.54 s.

Find the magnitude of the angular acceleration of the wheel.

Correct answer: 6.25984 rad/s^2.

007 (part 2 of 2) 10.0 points

Find the angle in radians through which it rotates in this time.

Correct answer: 20.193 rad.

Turntable Comes to a Stop
008 (part 1 of 2) 10.0 points

The turntable of a record player rotates at a rate of 45.6 rev/min and takes 53.5 s to come to rest when switched off.

Find the deceleration.

Correct answer: 0.0892565 rad/s^2.

009 (part 2 of 2) 10.0 points

How many revolutions did it make before coming to rest?

Correct answer: 20.33 rev.

Holt SF 07H 03
010 10.0 points

A dog sits 1.79 m from the center of a merry-go-round with an angular speed of 1.48 rad/s.

If the magnitude of the force that maintains the dog's circular motion is 35.9 N, what is the dog's mass?

Correct answer: 9.15626 kg.

Serway CP 07 21
011 10.0 points

A 2451 kg car rounds a circular turn of radius 35 m. The road is flat and the coefficient of friction between tires and road is 0.35.

The acceleration of gravity is 9.8 m/s^2 .

How fast can the car go without skidding?

Correct answer: 10.9567 m/s.

Car on a Flat Curve
012 10.0 points

A car is moving at 20 m/s along a curve on a horizontal plane with radius of curvature 51 m .

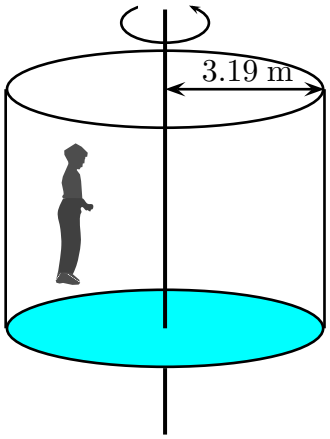
The acceleration of gravity is 9.8 .

What is the required minimum coefficient of static friction between the road and the car's tires to keep the car from skidding?

Correct answer: 0.80032.

Serway CP 07 51
013 10.0 points

In a popular amusement park ride, a rotating cylinder of radius 3.19 m is set in rotation at an angular speed of 5.65 rad/s, as shown. The floor then drops away, leaving the riders suspended against the wall in a vertical position.



What minimum coefficient of friction between a rider's clothing and the wall of the cylinder is needed to keep the rider from slipping? The acceleration due to gravity is 9.8 $\mathrm{m/s^2}$.

Correct answer: 0.0962362.

Orbiting Small Moon
014 10.0 points

Given: $G = 6.67259 \times 10^{-11}\ \mathrm{N\,m^2/kg^2}$

A small Moon of a planet has an orbital period of 2.77 days and an orbital radius of 3.7×10^5 km.

From these data, determine the mass of the planet.

Correct answer: 5.23219×10^{26} kg.