This print-out should have 9 questions. Multiple-choice questions may continue on the next column or page – find all choices before answering.

Child on a MerryGoRound 02 001 (part 1 of 2) 10.0 points

A child of mass 51.8 kg sits on the edge of a merry-go-round with radius 2.8 m and moment of inertia 324.89 kg m^2 . The merry-go-round rotates with an angular velocity of 2.9 rad/s.

What radial force does the child have to exert to stay on the merry-go-round?

Correct answer: 1219.79 N.

002 (part 2 of 2) 10.0 points

The child then walks towards the center of the merry-go-round and stops at a distance 1.064 m from the center. Now what is the angular velocity of the merry-go-round?

Correct answer: 5.52732 rad/s.

Serway CP 08 55 D 003 (part 1 of 2) 10.0 points

A cylinder with moment of inertia 32.5 kg m^2 rotates with angular velocity 4.94 rad/s on a frictionless vertical axle. A second cylinder, with moment of inertia 37.7 kg m^2 , initially not rotating, drops onto the first cylinder and remains in contact. Since the surfaces are rough, the two eventually reach the same angular velocity.



Correct answer: 2.28704 rad/s.

004 (part 2 of 2) 10.0 points

Show that energy is lost in this situation by calculating the ratio of the final to the initial kinetic energy.

Correct answer: 0.462963.

Unwinding a Wheel 01 005 (part 1 of 2) 10.0 points

A wheel of radius 30 cm, mass 1 kg, and moment of inertia 0.045 kg m^2 is mounted on a frictionless, horizontal axle as shown. A light cord wrapped around the wheel supports an object of mass 0.9 kg.



Find the tension T in the cord. The acceleration due to gravity is 9.8 m/s^2 .

Correct answer: 3.15 N.

006 (part 2 of 2) 10.0 points

What is the angular acceleration of the wheel?

Correct answer: 21 rad/s^2 .

Beam with Pin and Cable 007 10.0 points

Two weights attached to a uniform beam of mass 36 kg are supported in a horizontal position by a pin and cable as shown in the figure.



What is the tension in the cable which supports the beam? The acceleration of gravity is 9.8 m/s^2 .

Correct answer: 0.627791 kN.

Tipler PSE5 12 32 008 (part 1 of 2) 10.0 points

The uniform diving board has a mass of 26 kg.



Find the force on the support A when a 68 kg diver stands at the end of the diving board. The acceleration of gravity is 9.81 m/s^2 .

Correct answer: 3.05091 kN.

009 (part 2 of 2) 10.0 points Find the force on the support B at that same instant.

Correct answer: 3.97305 kN.