PHYS 101: General Physics 1 KOÇ UNIVERSITY Spring Semester 2017

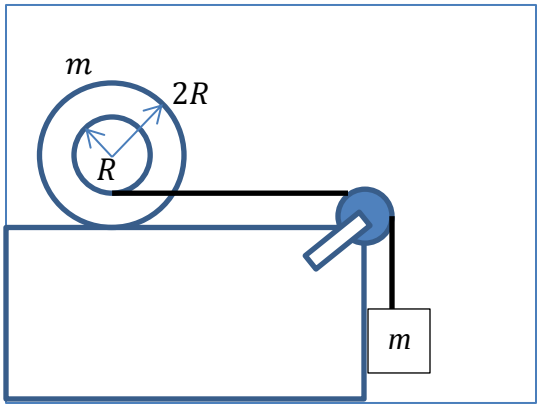
College of Arts and Sciences

Section Quiz 10a-1 2017

Closed book. Duration:

Name: Student ID: Signature:

A yo-yo consists of two coaxial disks each of mass *m* and radius *R* and radius *2R*, respectively. The yo-yo is initially at rest on a table. A rope is wound around the smaller disk and suspended through a frictionless pulley at from the end of the table by a particle of mass *m*. When the system is released, the disk rolls without slipping on the table. $I_{cm-disk} = \frac{mR^2}{2}$



a) Draw the free-body diagrams of the particle and the disk. Indicate the coordinate system you set for each diagram clearly.
b) Determine the angular and linear acceleration of the yo-yo.
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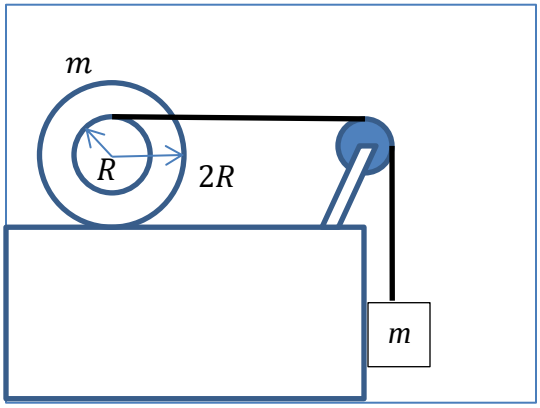
College of Arts and Sciences

Section Quiz 10a-2

Closed book. Duration:

Name: Student ID: Signature:

A yo-yo consists of two coaxial disks each of mass *m* and radius *R* and radius *2R*, respectively. The yo-yo is initially at rest on a table. A rope is wound around the outer disk and suspended through a frictionless pulley at from the end of the table by a particle of mass *m*. When the system is released, the disk rolls without slipping on the table. $I_{cm-disk} = \frac{mR^2}{2}$



a) Draw the free-body diagrams of the particle and the disk. Indicate the coordinate system you set for each diagram clearly.
b) Determine the angular and linear acceleration of the yo-yo.

PHYS 101: General Physics 1 KOÇ UNIVERSITY Spring Semester 2017

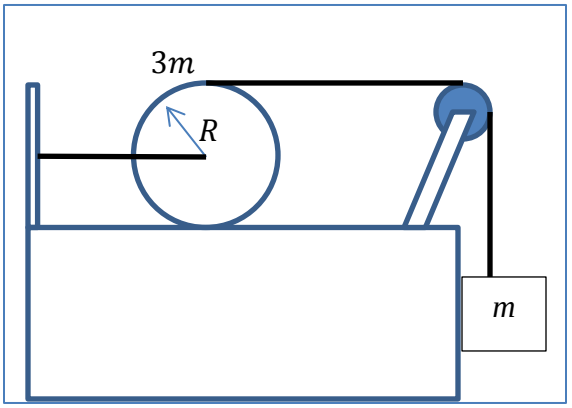
College of Arts and Sciences

Section Quiz 10a-3

Closed book. Duration:

Name: Student ID: Signature:

A particle of mass *m* is suspended by a rope on the vertical side of a table. The rope is passing through a frictionless pulley and threaded around the rim of a disk of mass 3*m*, and radius *R*. The disk is on the table and the center axis of the disk is attached by a rope to a wall. The disk can rotate about its center axis. It is observed that the particle moves downward with constant speed. $I_{cm-disk} = \frac{mR^2}{2}$



a) Draw the free-body diagrams of the particle and the disk. Indicate the coordinate system you set for each diagram clearly.
b) Determine the friction coefficient of the table.
c) Determine the tension in the rope connected to the center of the disk.
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