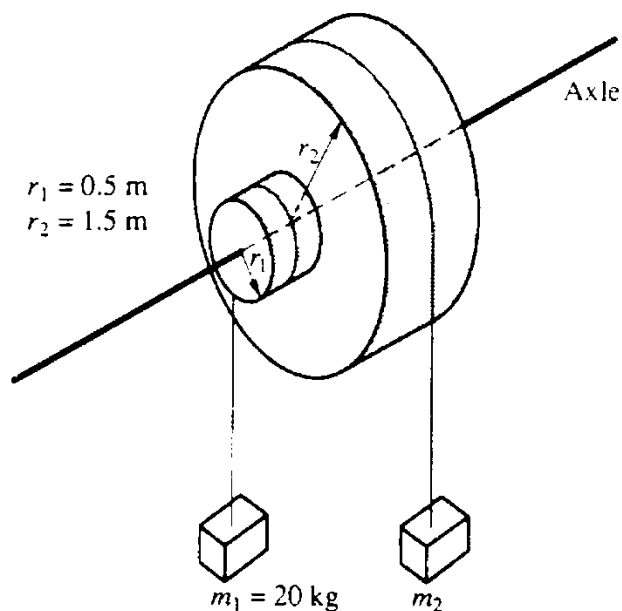


Name \_\_\_\_\_ Date \_\_\_\_\_ Period \_\_\_\_\_



2. Two masses,  $m_1$  and  $m_2$ , are connected by light cables to the perimeters of two cylinders of radii  $r_1$  and  $r_2$ , respectively, as shown in the diagram above with  $r_1 = 0.5$  meter,  $r_2 = 1.5$  meters, and  $m_1 = 20$  kilograms.

Determine  $m_2$  such that the system will remain in equilibrium.

Apply rotational equilibrium with the center as the pivot

$$(m_1 g) \cdot r_1 = (m_2 g) \cdot r_2$$

$$(20)(9.8)(0.5) = m_2(9.8)(1.5)$$

$$m_2 = 6.67 \text{ kg}$$