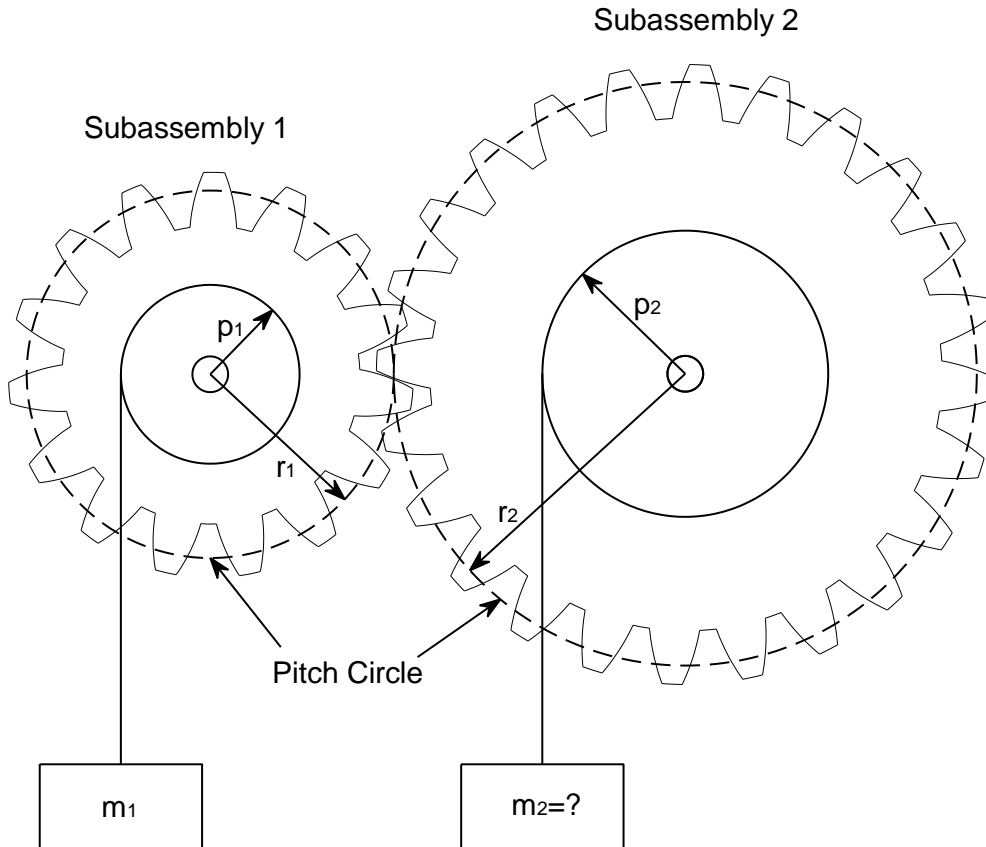


Hands-On Gear Homework

Solve the problem below before lab using the Gear Exercise Worksheet on the other side of this page. In lab your team will test your result on an actual gear setup. If the weight test is successful and the FBD write-up is correct, the team will receive an extra high power component to add to their robot kit!

Step 1: Review the Gear-Pulley Mechanism. The rigidly connected gear and pulley combination on the left is subassembly 1, and the combination on the right is subassembly 2.



The known parameters are:

$p_1, p_2 \Rightarrow$ radius pulleys $r_1, r_2 \Rightarrow$ radius of pitch circles

$s_1, s_2 \Rightarrow$ mass of subassembly 1 and 2

$m_1 \Rightarrow$ mass hanging from subassembly 1

The challenge is to find the values of mass m_2 that will initiate motion

(see other side)

2. Draw the FBDs of both subassemblies 1 and 2 below.

FBD of Subassembly 1	FBD of Subassembly 2

3. Write out the equilibrium equations for each subassembly below.

Subassembly 1	Subassembly 2

4. Determine the equation for mass m_2 that would keep the system in equilibrium.

(see other side)