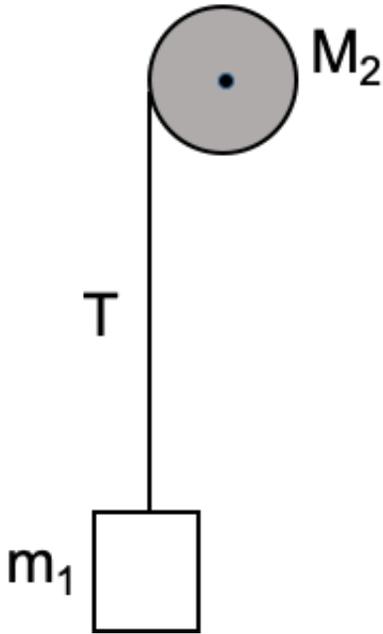


### Question 1 (2 points)

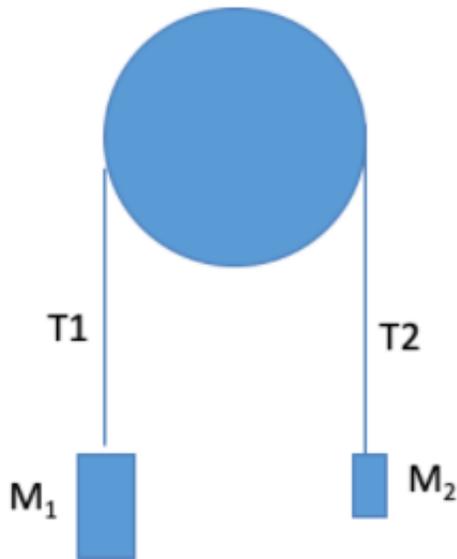
The hanging mass has mass  $m_1$  and is accelerating downwards. What is the torque **on this pulley** of radius  $R$  and mass  $M_2$ ?



- $(m_1 + M_2)gR$
- $m_1g$
- $(m_1g)R$
- $TR$
- Both C and D are correct.
- Both A and D are correct.

### Question 2 (2 points)

Say that  $M_1 > M_2$  and the pulley is a solid disk of mass  $M_p$  and radius  $R$ . The system moves so that  $M_1$  accelerates downwards with acceleration  $a$ .

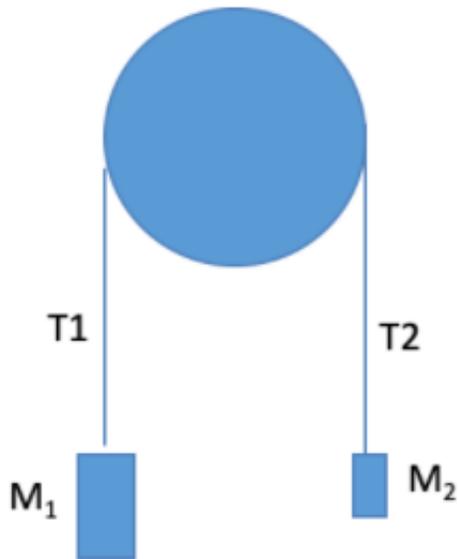


To solve this system for the acceleration **and** the tensions in the rope, you would...

- Use N2L for linear motion twice and N2L for rotational motion once.
- Use N2L for rotational motion three times.
- Use N2L for linear motion once.
- Use N2L for rotational motion once.

### Question 3 (2 points)

Say that  $M_1 > M_2$  and the pulley is a solid disk of mass  $M_p$  and radius  $R$ . The system moves so that  $M_1$  accelerates downwards with **linear** acceleration  $a$ .



What do you get for the equation of motion for the pulley after simplifying your answer?

- $T_1 + T_2 = M_p a$
- $T_1 R + T_2 R = M_p a$
- $T_1 + T_2 = \frac{1}{2} M_p a$
- $T_1 - T_2 = \frac{1}{2} M_p a$
- $T_1 - T_2 = M_p a$

#### Question 4 (2 points)

What are the SI units of dm?

- No units— it's just a calculus placeholder.
- $\text{kg/m}^3$
- $\text{kg/m}$
- $\text{kg}$
- $\text{kg m}^2$

### Question 5 (2 points)

Say you have a long metal stick with a heavy sphere at the end, and you want to balance this upright on one finger. Would this be easier to keep balanced on your finger with the sphere at the bottom or at the top? (Try it by modeling this situation with equipment you find at home, like clay and a pencil. Or a hammer with a wood handle and metal head. Make sure to balance on your finger and not on a table. Also think about MOI: When talking about keeping something balanced, do you want it to rotate easily or not?)

- It's easier with the sphere at the bottom.
- It's easier with the sphere at the top.
- There's no difference.

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*0 of 5 questions saved*

