

## Rotational Equilibrium Worksheet

As you work through the steps in the lab procedures, record your experimental values and the results on this worksheet.

### Procedure A: Balancing torques

Position of center of mass of meter stick = \_\_\_\_\_

**Data Table 1**

	Mass (g)	Lever arm (cm)	Torque ( $\text{g}\cdot\text{cm}^2/\text{s}^2$ ) (include sign)
$m_1$			
$m_2$			
$m_3$			predicted =

Predicted value of  $x_3$  = \_\_\_\_\_

Experimental value of  $x_3$  = \_\_\_\_\_

Percent difference between predicted and experimental values of  $x_3$  = \_\_\_\_\_ %

Are the predicted and experimental values of  $x_3$  in close agreement? (A difference of  $\pm 3\%$  would be considered acceptable in this situation.)

**Circle one:**    Yes    No

<b>CHECKPOINT 1:</b> Set-up and calculations
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**Procedure B:** Finding the Mass of the Meter Stick

Draw a sketch of the experimental set-up with appropriate labels in the space below.

**Data Table 2**

	Mass (g) (g)	Lever Arm	Torque (g·cm <sup>2</sup> /s <sup>2</sup> ) (include sign)
$m_1$			
$m_2$			predicted =

Predicted value of mass of meter stick:  $m_{2,\text{predicted}} =$  \_\_\_\_\_

Experimental value of mass of meter stick:  $m_{2,\text{exp}} =$  \_\_\_\_\_

Percent difference between  $m_{2,\text{predicted}}$  and  $m_{2,\text{exp}} =$  \_\_\_\_\_ %

Are the predicted and experimental values of  $m_3$  in close agreement? (A difference of  $\pm 3\%$  would be considered acceptable in this situation.)

**Circle one:**    Yes    No

**CHECKPOINT 2:** Diagram, uncertainty formula, set-up, and calculations

**Procedure C:** Determining an unknown mass

Draw a sketch of the experimental set-up with appropriate labels in the space below.

**Data Table 3**

	Mass (g) (g)	Lever Arm $x$ (cm)	Torque ( $\text{g}\cdot\text{cm}^2/\text{s}^2$ ) (include sign)
$m_1$			
$m_2$			
$m_3$			predicted =

Predicted value of mass of shot plus bucket:  $m_{3,\text{predicted}} =$  \_\_\_\_\_

Experimental value of mass of shot plus bucket:  $m_{3,\text{exp}} =$  \_\_\_\_\_

Percent difference between  $m_{3,\text{predicted}}$  and  $m_{3,\text{exp}} =$  \_\_\_\_\_ %

Are the predicted and experimental values of  $m_3$  in close agreement? (A difference of  $\pm 10\%$  would be considered acceptable in this situation.)

**Circle one:**    Yes    No

**CHECKPOINT 3:** Diagram, set-up, and calculations