M36  ANALYSIS OF A PERFECTLY INELASTIC COLLISION

DATA & RESULTS

mass of ball, 
\[ m = ( \_\_\_\_\_\_ \pm \_\_\_\_\_\_ ) \text{ kg} \]

Mass of pendulum cage, 
\[ M = ( \_\_\_\_\_\_ \pm \_\_\_\_\_\_ ) \text{ kg} \]

Determination of initial velocity, \( v_i \) (speed of ball immediately before collision)

Average range of ball, 
\[ \bar{r} = ( \_\_\_\_\_\_ \pm \_\_\_\_\_\_ ) \text{ m} \]

Vertical displacement of ball, 
\[ h = ( \_\_\_\_\_\_ \pm \_\_\_\_\_\_ ) \text{ m} \] (see box at bottom of page)

Determination of final velocity, \( V_f \) (speed of ball/cage immediately after collision)

Initial height of cage, 
\[ H_i = ( \_\_\_\_\_\_ \pm \_\_\_\_\_\_ ) \text{ m} \]

Final height of cage:

<table>
<thead>
<tr>
<th>Trial 1</th>
<th>Trial 2</th>
<th>Trial 3</th>
<th>Trial 4</th>
<th>Trial 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final Height, ( H_f ) (m ± ______ m)</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Change in height of cage, 
\[ H = ( \_\_\_\_\_\_ \pm \_\_\_\_\_\_ ) \text{ m} \]
\[ (H = \bar{H}_f - H_i) \]

<table>
<thead>
<tr>
<th>Before Collision</th>
<th>After Collision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed (m/s)</td>
<td></td>
</tr>
<tr>
<td>Momentum (kg·m/s)</td>
<td></td>
</tr>
<tr>
<td>Kinetic Energy (J)</td>
<td></td>
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</tbody>
</table>

In the space below, describe the method that you used to measure \( h \):