Physical pendulum

Questions

1. For a fixed length (L) of the bar, what happens to the time period of oscillation with increase in distance (r) between centre of mass and the point of suspension?
2. For a fixed value of r, what happens to the time period of oscillation with increase in length of the bar?
3. For a fixed length (L) of the bar, how does the moment of inertia (I) change with increase in distance (r) between centre of mass and the point of suspension?
4. For a fixed value of r, how does the moment of inertia (I) change with increase in the length of the bar?
5. Does the time period increase with increase in mass of the bar?
6. Does the time period of oscillation change linearly with moment of inertia of the bar?
7. Plot the graph of the time period (T) of oscillation as a function of r. How is this plot different from that of simple pendulum?
8. Plot T^2 as a function of r of the pendulum. Can acceleration due to gravity be calculated from it (as it was done for simple pendulum)?
9. In a real experiment of physical pendulum, what are the possible sources of errors and how can those errors be minimized?

Note :

Questions given above may be visualized and solved using the simulations, obtaining a mathematical solution is to be always treated as the final answer. Such a mathematical solution implies that one is able to understand and apply the concept.

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