1. A bullet of mass $m$ traveling horizontally with initial speed $v_i$ embeds into a block of mass $M$ which is initially at rest on a table. The block is attached to a string of radius $r$. After the collision, the bullet-block combination rotates one complete revolution before coming to rest as a result of friction between the block and the table. Where appropriate, express your answers in terms of $m, M, v_i, r,$ and $g$.

(a) [2pts] Name the type of collision.

(b) [5pts] Find the linear speed of the bullet-block just after the collision. What is the angular speed $\omega$?

(c) [5pts] What is the coefficient of kinetic friction $\mu_k$ between the block and the table?

(d) [3pts] Calculate the angular acceleration of the bullet-block combination.