Name: Date:

An experiment is performed using the apparatus at right. A small disk of
mass m_1 on a frictionless table is attached to one end of a string. The
string passes through a hole in the table and an attached narrow, vertical
plastic tube. An object of mass m_2 is hung at the other end of the string. A
student holding the tube makes the disk rotate in a circle of constant
radius r, while another student measures the period T.
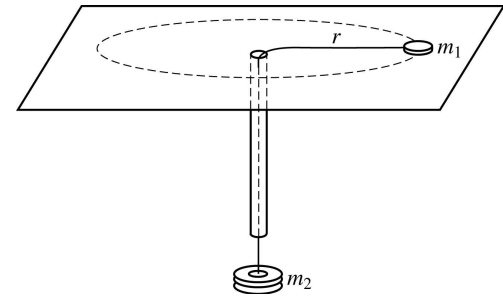
 a) Derive an expression for T in terms of m_1, m_2, r, and fundamental
    constants, as appropriate.

The procedure is repeated, and the period T is determined for four different values of m_2, where
$m_1 = 0.012\ kg$ and $r = 0.80\ m$. The data, which are presented below, can be used to compute an
experimental value for g.

m_2 (kg)	0.020	0.040	0.060	0.080
T (s)	1.40	1.05	0.80	0.75

 b) What quantities should be graphed to yield a straight line with a slope that could be used to
    determine g?

c) On the grid below, plot the quantities determined in part (b), label the axes, and draw the best-fit line to the data. You may use the blank rows above to record any values you may need to calculate.
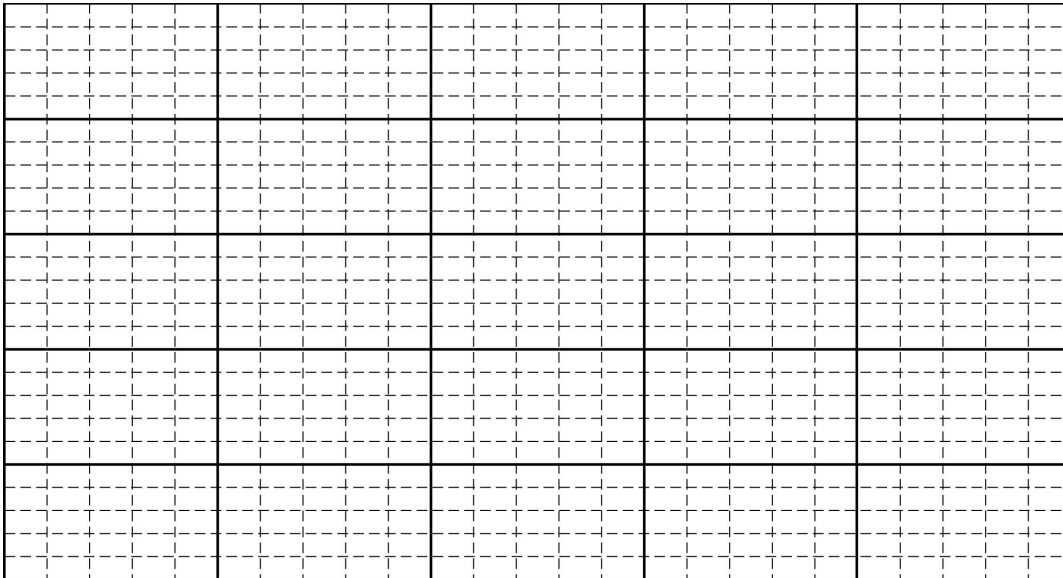
d) Use your graph to calculate the experimental value of g. **Hint**: calculate the slope of the graph and use it to determine g,