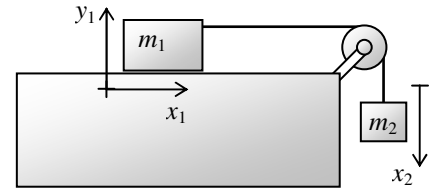


Quiz #7

Name: _____

Block m_1 rests on a table. A thin string passes horizontally from block 1, over a frictionless pulley, and then supports block m_2 . There is some friction μ_k between m_1 and the table. You may not write parenthesis in any answer box. Correct answers will have no difficulty fitting into the boxes provided!

Use a pencil, not a pen.



1. Draw a free body diagram of block m_1 . There should be 4 forces.

2. Draw a free body diagram of block m_2 over here. There should be only 2 forces.

3. Use Newton's Second Law for the first diagram ($\Sigma F_{y1} = m_1 a_{y1}$), and replace a_{y1} with its value (obtained by looking at the picture). Find an expression for the normal force. Use the coordinate system with $+y_1$ or $+a_{y1}$ pointing **up**, as shown.

$N =$

3. Use Newton's Second Law for the first diagram ($\Sigma F_{x1} = m_1 a_{x1}$) to get an expression for the tension in the string. Use the coordinate system with $+x_1$ or $+a_1$ pointing **to the right**, as shown. Substitute in your previous value for N . Your answer will have μ_k in it, and sadly, will still have the unknown a_{x1} in it.

$T =$

4. Use Newton's Second Law for the second diagram ($\Sigma F_{x2} = m_2 a_{x2}$) to get an expression for the tension in the string. Use the coordinate system with $+x_2$ or $+a_2$ pointing **down**, as shown. Your answer will sadly have a_{x2} in it.

$T =$

5. Set your two expressions for tension equal to each other. From the picture, $a_{x1} = a_{x2}$, so just replace both of them with " a ". Then solve for a . Your answer will include the symbols m_1 , m_2 , g , and μ_k .

$a =$