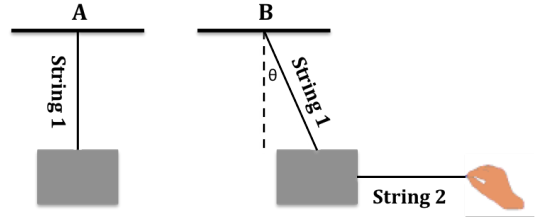


Chapter 3.1-3.4 On-paper Homework

A shows a block hanging from a string. You pull the block to the side with another string (shown in **B**).



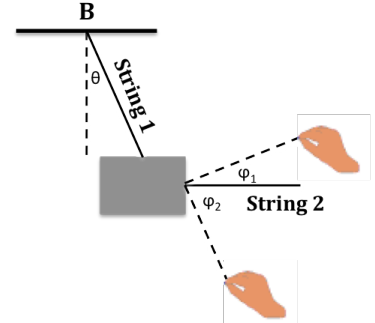
I. Consider the following student statements about the tension in String 1 (T_1) in situations **A** and **B**:

Student 1: *“The tension force due to String 2 in **B** is helping to support the block. Therefore, T_1 in **A** is greater than T_1 in **B**.”*

Student 2: *“I think T_1 would be the same in **A** and **B** because the string is the same length and it’s acting from the same point”*

Do you agree with either student? Explain your reasoning. (Hint: a free-body diagram will probably help you here.)

II. Suppose now that you pull the block with the same magnitude force but not directly to the right (as shown in the figure at the right.)



a) Draw free-body diagrams that show all the forces acting on the block when you pull to the right in different directions.

b) In what way can you pull on String 2 so that T_1 is *always* bigger than in case **A**?

c) Is there a way of pulling the block so that T_1 is smaller than in case **A**? If it is hard to tell in some cases, tell us what you would need to know in order to say for sure. (Hint: angles θ , φ_1 , and φ_2 are variables)