CIV102F Quiz # 2: Wednesday AM September 23, 2020
Basic Concepts

For the system of weights, wires and pulleys shown below, perform the following:

1. Calculate the force which is required to pull the 75 kg weight up the slope.
2. Using your answer from Q1, what value of W is needed to pull the weight up the slope? Report your answer in kg.
3. What is the smallest diameter of Wire A which can be used to pull the box up? The maximum allowable stress is 150 MPa.
4. Calculate the stress in wire B for the value of W calculated in part 2. Consider the vertical segment of wire B at the bottom of the drawing, which will stretch and get longer due to the weight of W. If two markers spaced 3 m apart were placed on that wire segment before the loads were applied, how much would they move apart from each other due to the loads? Assume E = 200,000 MPa.

The geometry of the wires can be obtained using the provided length values. Free body diagrams must be provided in order to obtain full marks.