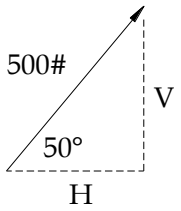
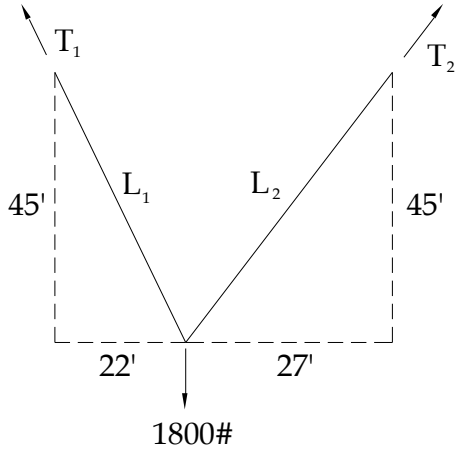
NAME:_____

1) Draw a free body diagram of a 10-foot long beam supported at each end with a bundle of multi-cable run along its entire length (it weighs 5 pounds per foot) and a 300lb line array hanging 3 feet from the left end. (2 points)

2) Find the horizontal and vertical components of this force: (2 points)



3) Find the length of and tension in each bridle leg: (4 points)



Remember to show ALL your work and to label your units!
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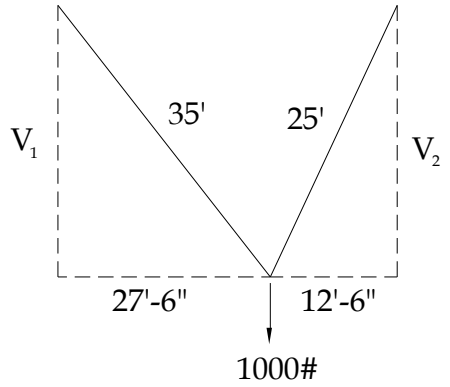
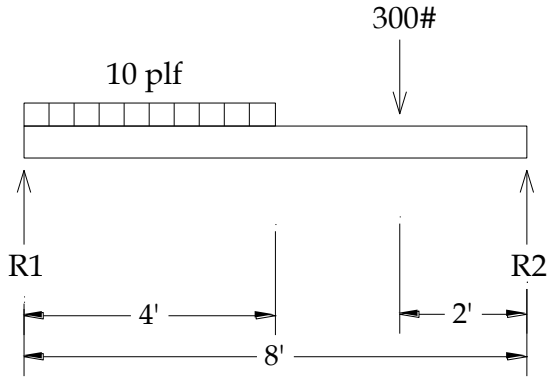
4) This bridle is rigged from beams 80'-0" from the floor. How high above the floor is the bridle junction? What is the tension in each leg? (5 points)



5) Find the reactions for this free body diagram: (4 points)



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6) Find the tensile stress in a 5/8" diameter round steel rod that is supporting 5000#. (2 points)

7) Find the allowable tensile load on an A36 steel bar measuring 1/4"x3" in cross-section. The F_t of A36 steel is 21,600 psi. (2 points)

8) If a rope that is 60 feet long stretches 4" when loaded, what is the strain? The answer may be a decimal or a percentage. (2 points)

9) What is the ultimate strength of a rope with a working load limit of 1,000# at a design factor of 8? (2 points)

10) What is the WLL on a piece of hardware with an ultimate breaking strength of 9,000# at a safety factor of 5? (2 points)

11) If a piece of chain is rated for a WLL of 3100# at a design factor of 4, what is the WLL at a design factor of 5? (2 points)

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McCullough