There is no prelab for this exercise.

## Method of Sections:

Introduction

We have seen that the forces in each member of a truss can be found by the Method of Sections. Recall that in this method, a free-body diagram of a section is sketched and the forces acting on the section are solved for by taking the sum of moments and sum of forces in the x- and y-directions equal to zero and determining the unknowns. From these free-body diagrams, equations are written balancing the forces applied to the joint.

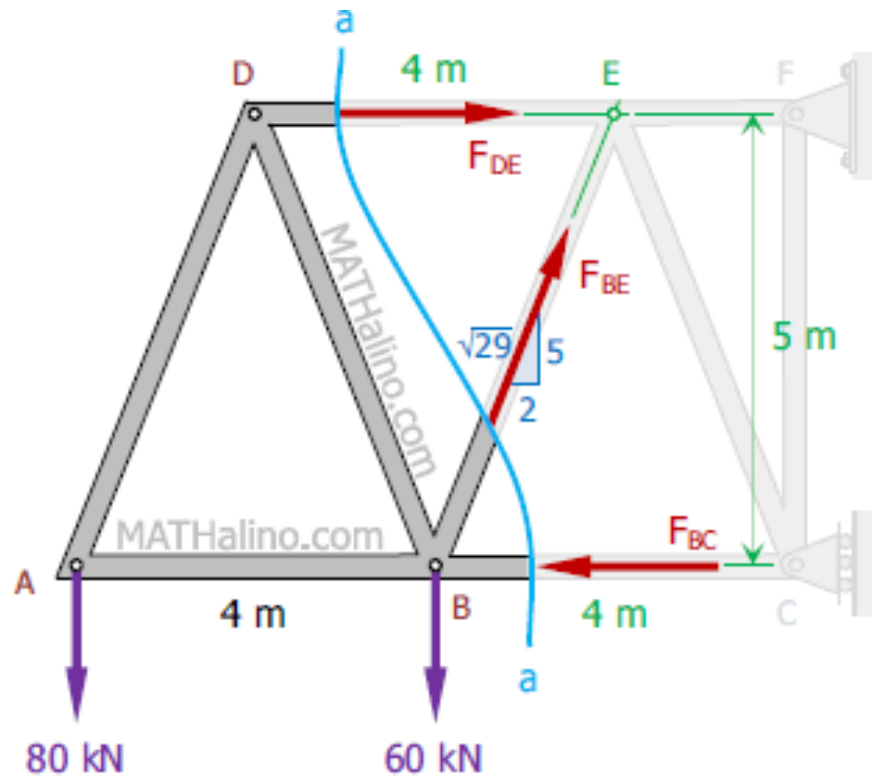To illustrate the method, consider the following example:
The truss in figure is pinned to the wall at point F, and supported by a roller at point C. Calculate the force (tension or compression) in members BC, BE, and DE.
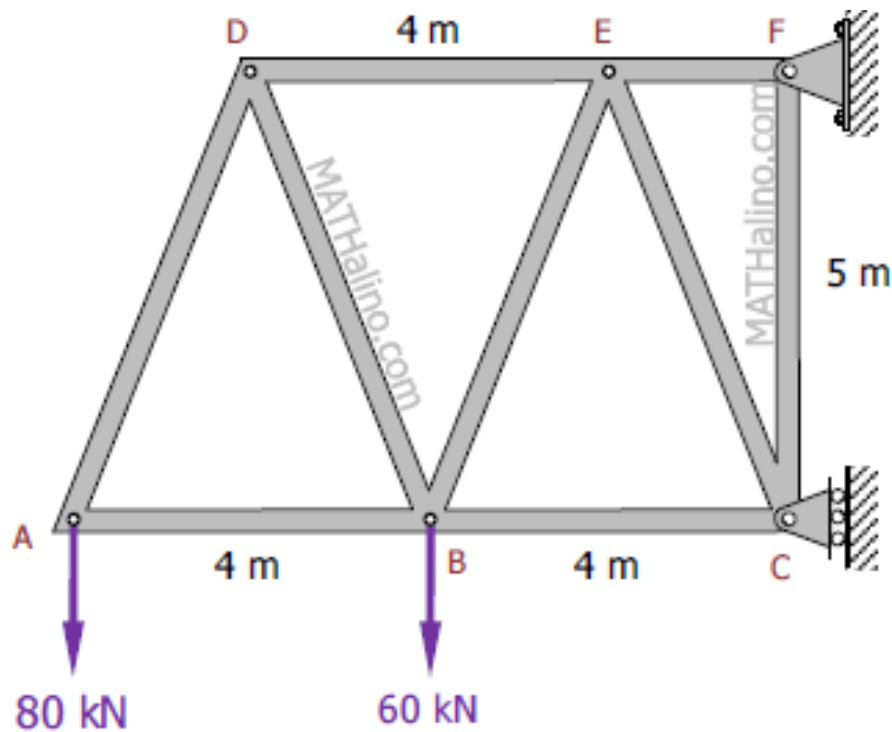
$\Sigma F_V = 0$
$\frac{5}{\sqrt{29}} F_{BE} = 80 + 60$
$F_{BE} = 150.78$ kN tension   *Answer*

From section to the left of a-a

Section to the left of a-a

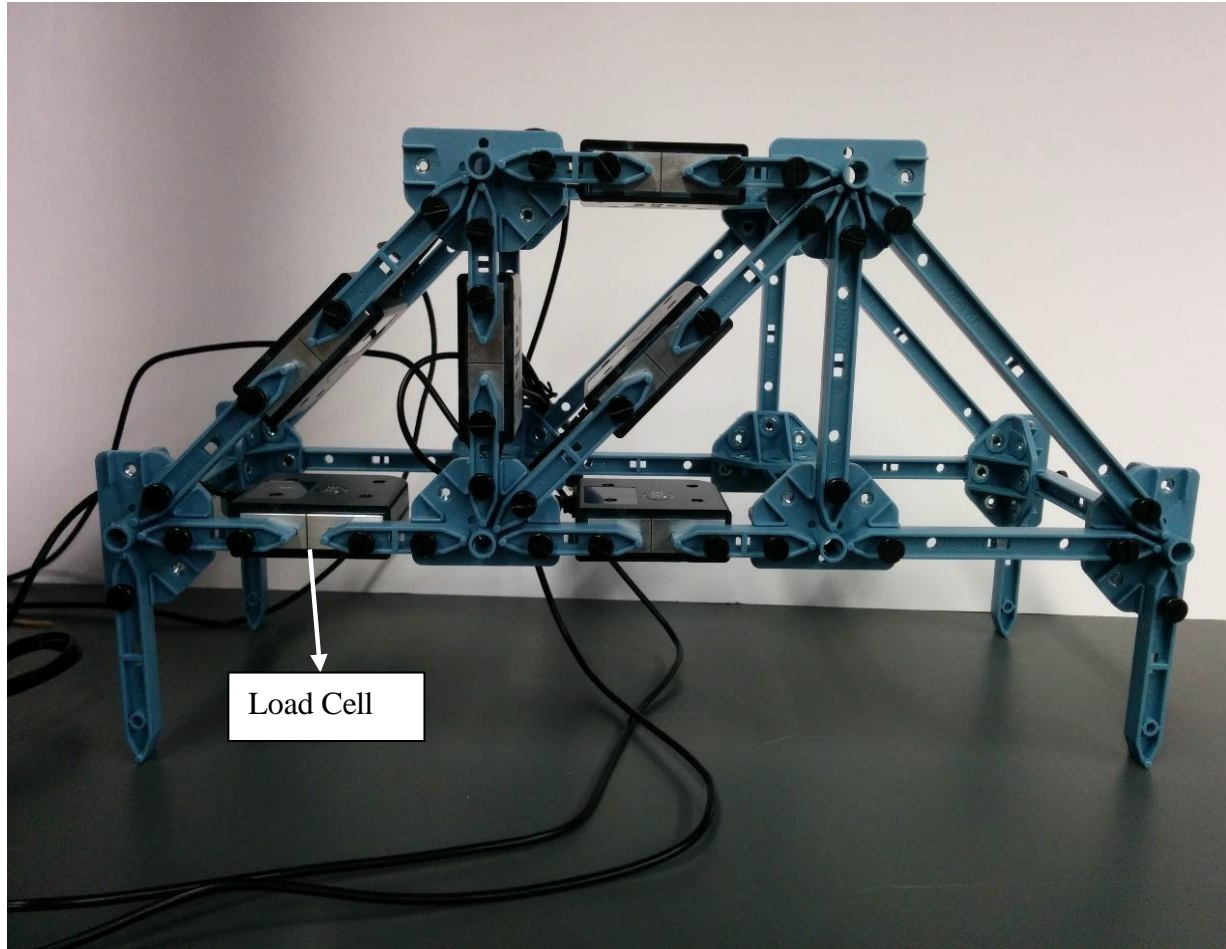$\Sigma M_E = 0$
$5F_{BC} = 6(80) + 2(60)$
$F_{BC} = 120$ kN compression   *Answer*

$\Sigma M_B = 0$
$5F_{DE} = 4(80)$
$F_{DE} = 64$ kN tension   *Answer*

With the help of the Pasco structure system and the Capstone software, we can measure the force in each member of the truss directly. As shown in the following figure.

Load Cell

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Measuring the Force in Members
Connect the load cells on the truss to the amplifier, and then connect the amplifier to computer. Open the software PASCO Captstone and use 6-digit display windows to show the force measured by 6 load cells. As shown in the following picture.

[Digits title here]		[Digits title here]	
\<Select Measurement\>	\<No Data Selected\>	\<Select Measurement\>	\<No Data Selected\>

[Digits title here]		[Digits title here]	
\<Select Measurement\>	\<No Data Selected\>	\<Select Measurement\>	\<No Data Selected\>

[Digits title here]		[Digits title here]	
\<Select Measurement\>	\<No Data Selected\>	\<Select Measurement\>	\<No Data Selected\>

Lab Exercises

1. This structure graph below is the same truss as shown in the figure above.
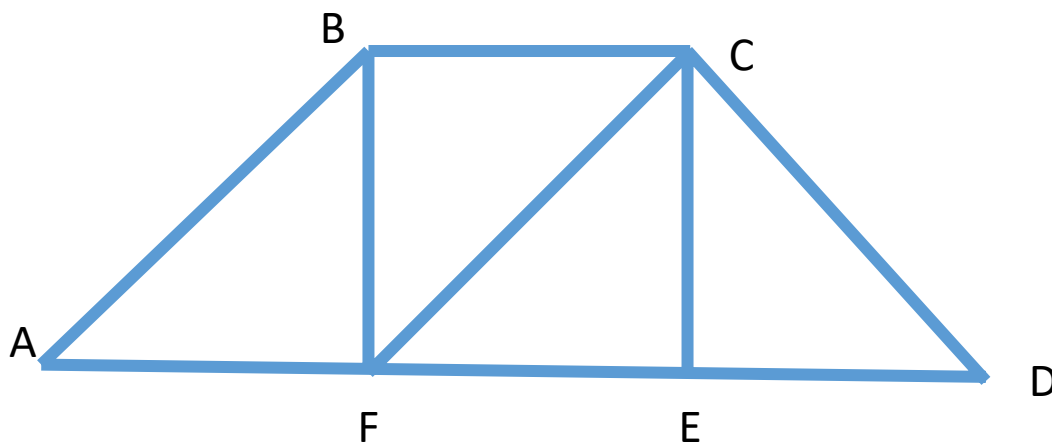
2. Use the method of sections to calculate members BC, FC, and FE forces and determine whether they are in compression or tension if a load were applied to joint F. Apply the same amount of load to the truss system at F by using a weight. Do the force read-outs support your calculations?

3. Use the method of sections to calculate members BC, FC, and FE forces and determine whether they are in compression or tension if a load were applied to joint E. Apply the same amount of load to the truss system at E. Do the force read-outs support your calculations?