Inflatable Structure Calculations

Mathematics and science often go hand-in-hand. The technology we use every day utilizes our understanding of the world to solve a variety of problems. To find the solutions required to solve problems with technology, engineers rely on their understanding of the world (science). Often, our understanding must be expressed in mathematical terms.

For this assignment, imagine you are going to patent the inflatable structure you have designed. In order to adjust the production line, manufacturing engineers require from you some information about your design. In some cases, your information must be provided in the form of an **equation** that allows for multiple solutions (perhaps for versions of your structure having different sizes).

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*Use the **provided** scale layout drawing and 3D sketch of an inflatable structure to answer the following questions:*

1. What is the total area of the plastic required for this inflatable structure? Show all your work and calculations. Be sure to include proper units with your answer. (In theory, this should be close to 3 m^2 – you were to try and use ALL of the plastic you were provided with!)

2. In words, explain what you needed to do to determine your total area.

3. Next, label each edge of your inflatable structure with a lower case letter. Each letter will be a **variable** representing the length of one of your edges. If you have edges that are the same length, you may use the same variable. Show these variables on your layout drawing (you may hand-write these on your drawing).

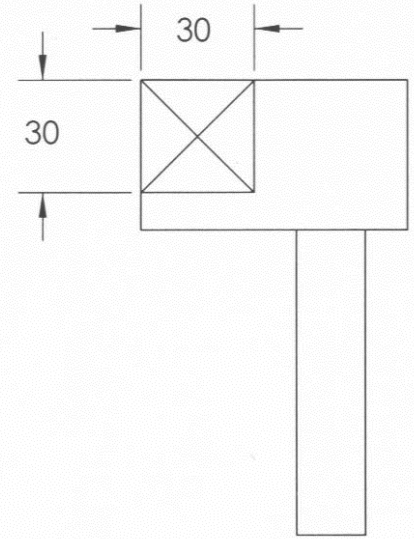
4. Write a mathematical expression using all of your variables that would determine the total area of plastic used by your structure.

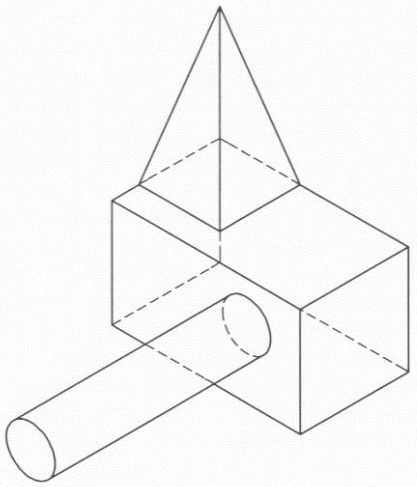
5. Perhaps the engineers need to know the amount of cutting required to make this structure (to estimate when knives will need to be sharpened for instance). Using the layout drawing, determine the total length of cutting required to make the structure. Be sure to include proper units.

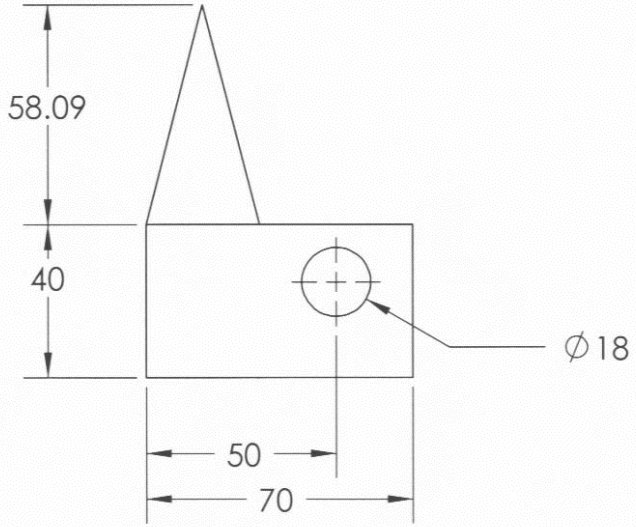
6. In words, explain what you did to determine this.

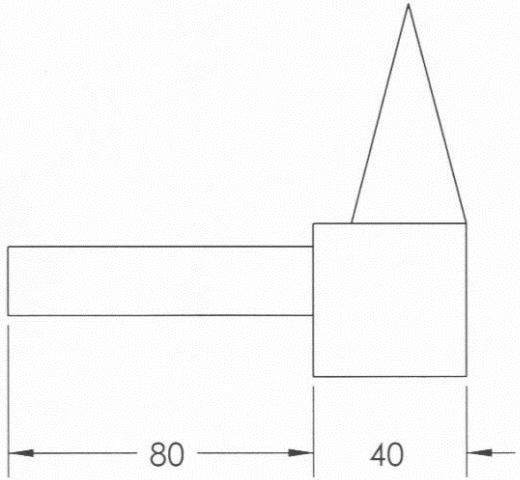
7. Write a mathematical equation using all of your variables, that would determine the total length of cutting required for your structure.

CLASS COPY!









ALL DIMENSIONS ARE IN MM

SAMPLE INFLATABLE	ADAM KIRSCH	SCALE: 1:2	11/3/10