

Structures Handout

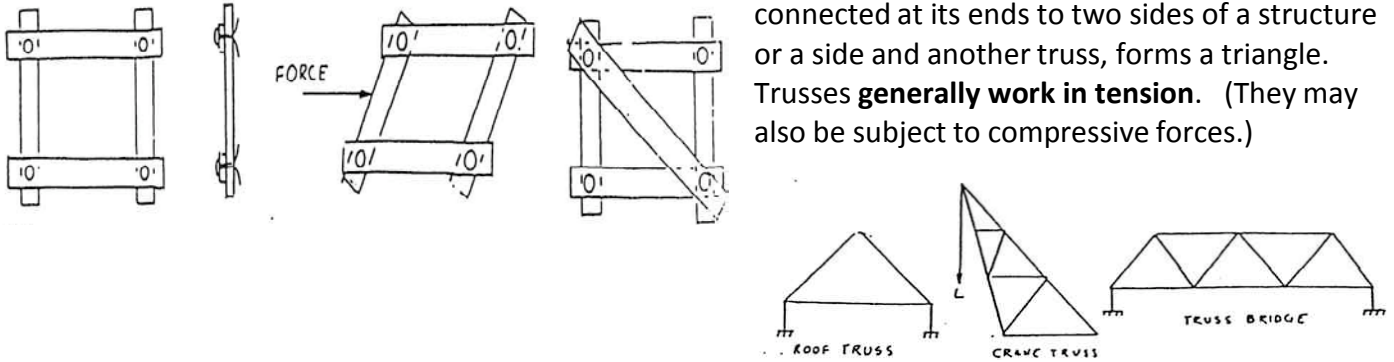
Trusses and Buttresses, Triangles and Static Structures

We will not be able to build **static structures** (i.e. structures that do not move or deform) unless we understand the important role of **triangles** in helping to create stability.

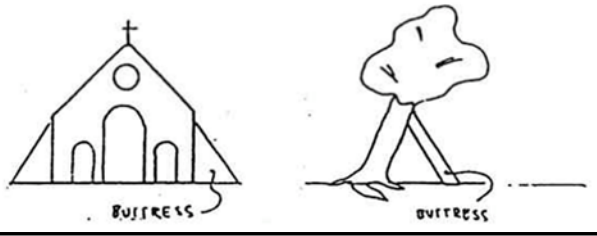
A **rectangular** structure is naturally unstable. If held together with a single connector such as a bolt, screw, rivet or nail in each corner, the rectangle can easily change its shape to a non-square parallelogram.

Trusses

A **truss** is a diagonal structural member. It is generally found **inside the structure**. Typically, a truss, when connected at its ends to two sides of a structure or a side and another truss, forms a triangle. Trusses **generally work in tension**. (They may also be subject to compressive forces.)

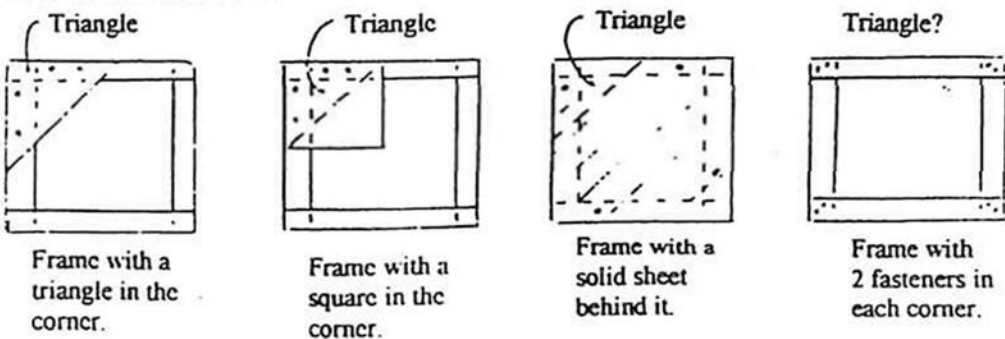


Buttresses



A **buttress** is attached to the **outside of a structure**. It forms a triangle when attached to the outside wall. **A buttress is always in compression**. It may be formed by a solid piece or consist of a single member. Its purpose is to provide a force against the forces pushing a wall or a member out and away from the structure.

Hidden triangles?



Structural triangles may not always look like triangles. Sometimes this triangulation effect will be achieved by using solid sections as shown below.

Name _____ Period _____ Date _____

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Homework Questions

1. A truss is generally said to be under what type of force? _____
2. Trusses are generally found _____ a structure.
3. A buttress is generally said to be under what type of force? _____
4. Buttresses are found _____ a structure.
5. Structural triangle always look like triangles, true or false? _____