Chapter 5

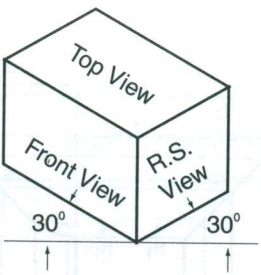
Development of Solids and Others

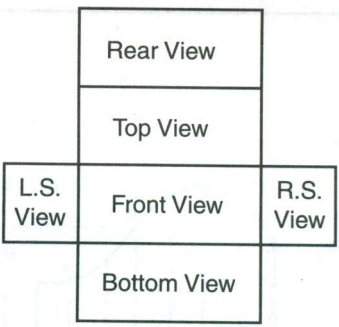
5.1 Development of Solids

5.1.1 Straight Line Development

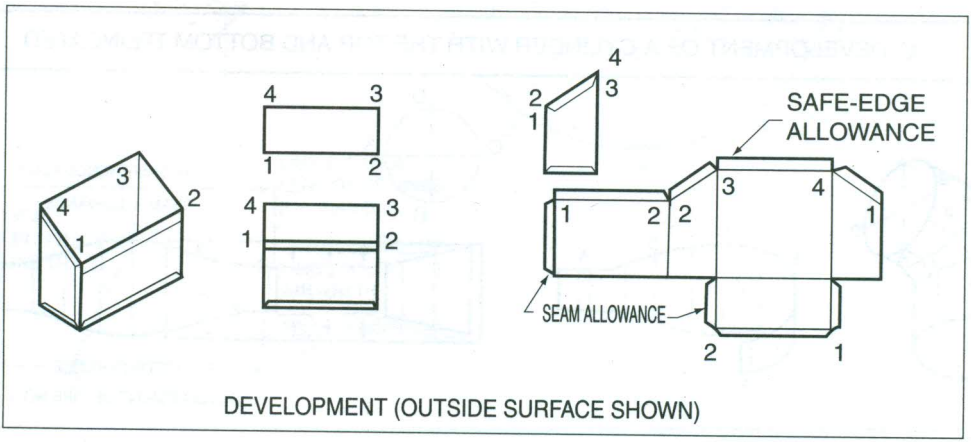
This term refers to the development of an object that has surfaces on a flat plane of projection. The true size of each side of the object is known and the sides can be laid out in successive order[44].

Now look at the simple example[45]

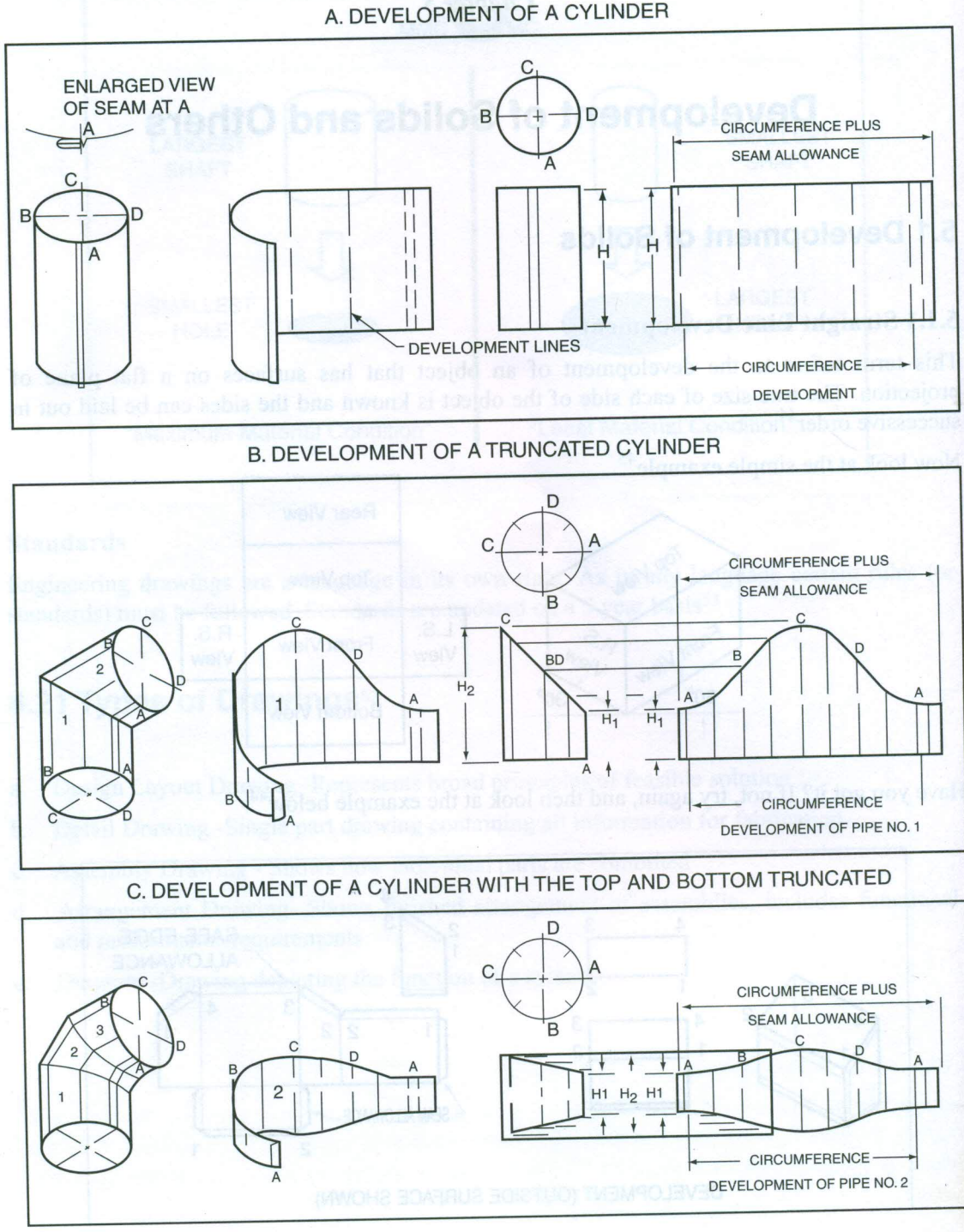




Have you got it? If not, try again, and then look at the example below[44].

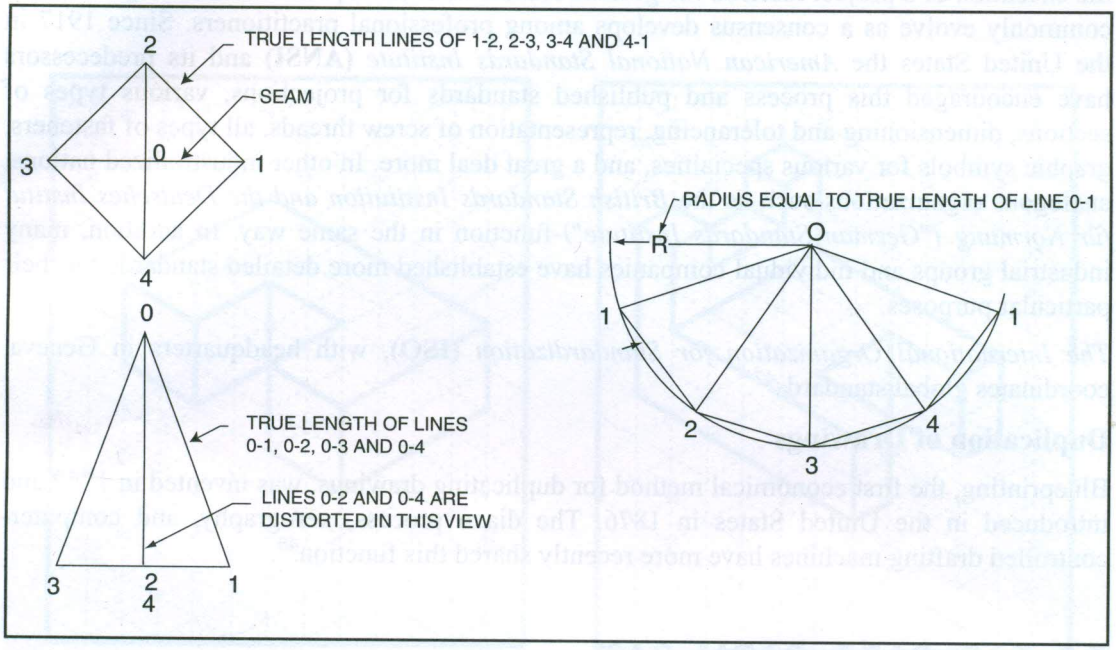


5.1.2 Parallel Line Development[46]

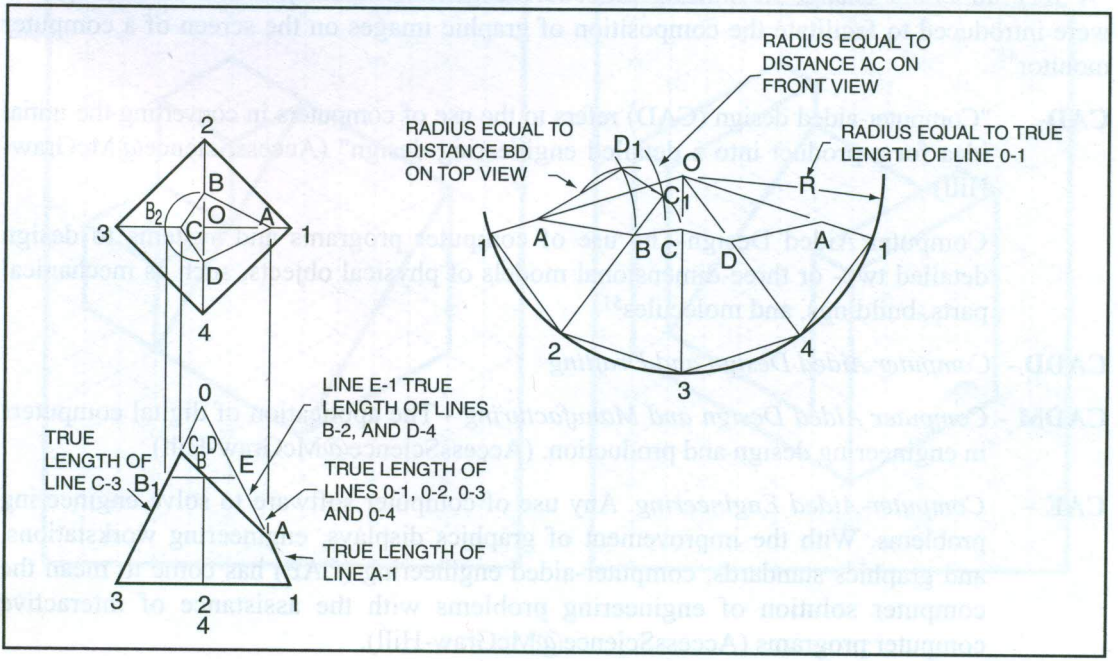


5.1.3 Radial-Line Development

A. DEVELOPMENT OF A PYAMID



B. DEVELOPMENT OF A TRUNCATED PYRAMID



5.2 Drafting Practice - Standards

The value of a set of drawings conveying the complete and correct information necessary for the execution of a project fostered the gradual standardization of practices. Drafting standards commonly evolve as a consensus develops among professional practitioners. Since 1917 in the United States the *American National Standards Institute* **(ANSI)** and its predecessors have encouraged this process and published standards for projections, various types of sections, dimensioning and tolerancing, representation of screw threads, all types of fasteners, graphic symbols for various specialties, and a great deal more. In other industrialized nations, analogous organizations-such as the *British Standards Institution and the Deutsches Institut für Normung ("German Standards Institute")*-function in the same way. In addition, many industrial groups and individual companies have established more detailed standards for their particular purposes.

The International Organization for Standardization **(ISO)**, with headquarters in Geneva, coordinates global standards[47].

Duplication of Drawings

Blueprinting, the first economical method for duplicating drawings, was invented in 1842 and introduced in the United States in 1876. The diazo process, xerography, and computer-controlled drafting machines have more recently shared this function[48].

5.3 CAD, CADD, CADM, CAE

"A very important change in drafting procedure began in the early 1960s when programs were introduced to facilitate the composition of graphic images on the screen of a computer monitor[48]"

CAD- "Computer-aided design (CAD) refers to the use of computers in converting the initial idea for a product into a detailed engineering design" (AccessScience@McGraw-Hill)

Computer Aided Design-The use of computer programs and systems to design detailed two- or three-dimensional models of physical objects, such as mechanical parts, buildings, and molecules[51].

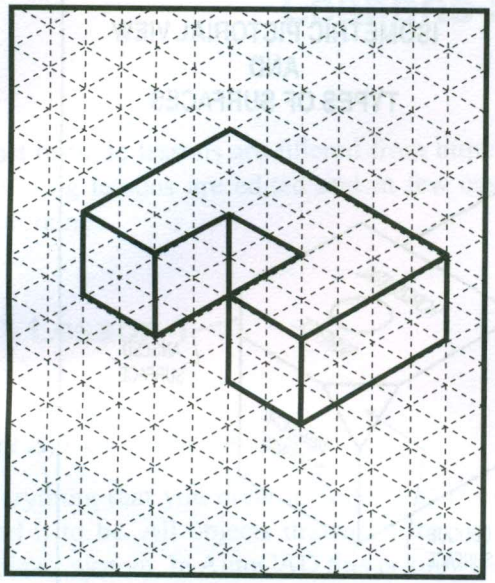
CADD - *Computer Aided Design and Drafting*

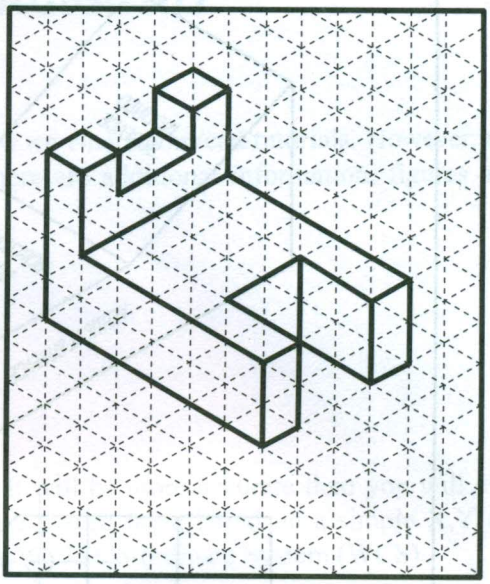
CADM - *Computer Aided Design and Manufacturing* - The application of digital computers in engineering design and production. (AccessScience@McGraw-Hill)

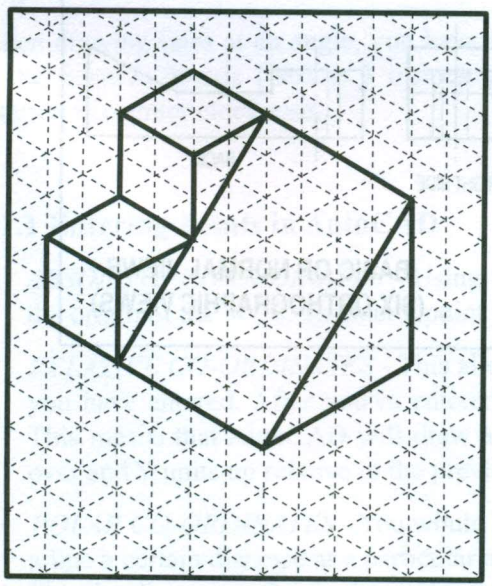
CAE - *Computer-Aided Engineering.* Any use of computer software to solve engineering problems. With the improvement of graphics displays, engineering workstations, and graphics standards, computer-aided engineering (CAE) has come to mean the computer solution of engineering problems with the assistance of interactive computer programs (AccessScience@McGraw-Hill).

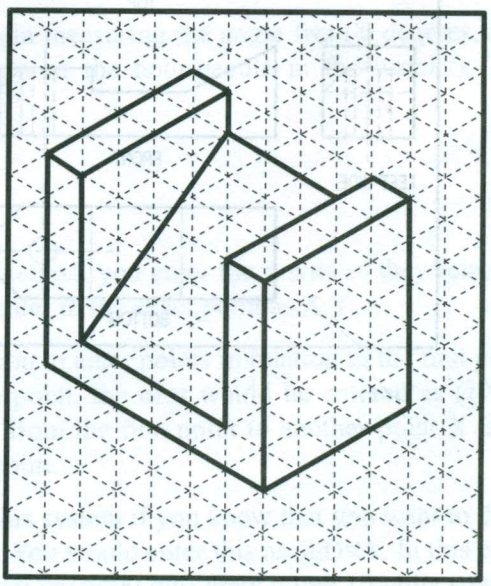
Exercises :

Put arrow in whatever direction you want and assume it as front side and then draw front, right side and top views. Figures are courtesy of Mr. Aaron Phoenix[49]









5.4 Orthographic, Isometric Views and Surfaces[54]