Question 2?

1. All dimension, extension, and leader lines should be thin, sharp, dark lines (.5mm/2H).

2. Extension lines indicate the points between which the dimension figures apply. They are drawn perpendicular to the dimension lines, start with a visible gap (~1/32") between them and the object, and terminate 1/8" (3.2 mm) beyond the last arrowhead.

3. Each dimension should be terminated by arrowheads touching the extension lines and pointing in opposite directions. Arrowheads are drawn freehand with .7mm/HB lead. The line should be broken only at the approximate center for the dimension figures.

4. Dimensions shown with dimension lines and arrowheads should be placed to be read from the bottom of the drawing (unidirectional system).

5. All dimensions should be given in decimal format. When dimensions are given in inches, leading zeros are omitted from dimension values less than 1.00

6. When all dimensions on a drawing are given in inches, the inch marks (") are omitted, the same applies to millimeters. If metric units are used, the word METRIC will appear boxed in a spot toward the lower portion of the drawing sheet.

7. A dimension line should never coincide with an object line or a center line, nor should it be an extension of these lines. Both, however, may be used as extension lines.

8. Crossing of extension lines or dimension lines should be avoided if possible. Where such crossings are unavoidable, there should be no break in either of the lines. However, if extension lines cross dimension lines through the arrowheads, the extension line may be broken.

9. Dimensions should be at least 3/8" (10 mm) from the object outline, then equally spaced at least 1/4" (6 mm) apart. A continuous series of dimensions should be aligned rather than staggered. Standard practice is to place the shortest dimensions nearest to the object and space adjacent parallel dimension lines further away from the object in order of their length.

10. Dimensions are preferably placed outside the outlines of the views.

11. When placement outside the views will result in (a) dimensions too far from the distance they indicate, (b) long and confusing extension lines or leader lines that cross other lines of the drawing, or (c) any confusion in understanding where the dimension applies, they may be placed inside the view and close to the distance they indicate.

12. As the distance dimensioned becomes less than about 1/2" (12.7 mm), the space between extension lines becomes too small for both arrowheads and figures. For these small dimensions the methods shown may be used. Each dimension should have two arrowheads associated with it, pointing in opposite directions. Dimensions can 'share' arrowheads. The following depicts appropriate forms for linear dimensions.

13. Where there are several parallel dimension lines in a group, the dimension figures should be staggered so that they will not interfere with one another.

14. Lettering (notes) should always be placed horizontal on the page, to be read from the bottom of the drawing (.7mm HB).

Question 3?

What is half section?

A half-section is a view of an object showing one-half of the view in section, as in the drawing below. The diagonal lines on the section drawing are used to indicate the area that has been theoretically cut. These lines are called *section lining* or *cross-hatching*. The lines are thin and are usually drawn at a 45-degree angle to the major outline of the object.

The spacing between lines should be uniform. A second, rarer, use of cross-hatching is to indicate the material of the object. One form of cross-hatching may be used for cast iron, another for bronze, and so on.

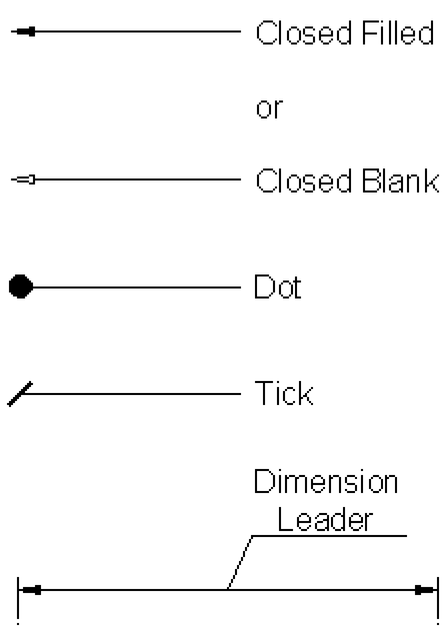
What is full section?

If the imaginary cutting plane passes through the entire object, splitting the drawn object in two with the interior of the object revealed, this is called a "**full section**." A **full section** is the most widely-used sectional view.

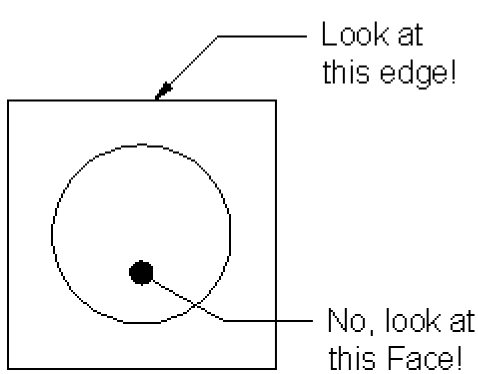
Question 4?

The leader line itself should be a continuous Thin line (see this post on [Linetype Definitions](#)). A leader line also has a terminator and some text. A leader line may have a reference line under the text.

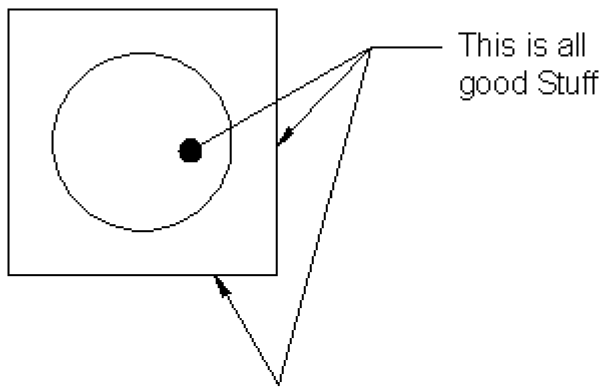
The British technical drawing standards give us four different types of terminators to use with our leader lines.



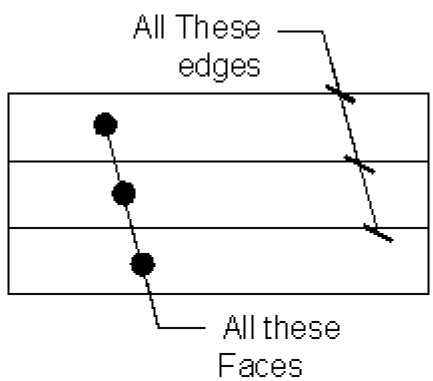
An arrow terminator is used to point to an edge of an item. The dot is used to point to a face. The Architectural tick can be used for referring to multiple parallel edges. The final type of line has no terminator, and is used for pointing at dimension lines or lines of Symmetry.



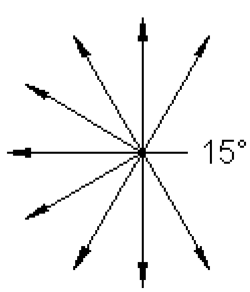
Leader lines can have multiple segments and you can use one annotation to reference multiple faces and edges.



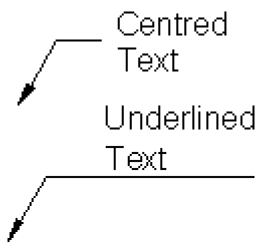
You can reference multiple parallel edges or faces with one leader.



It is recommended that you draw your leader lines at an angle to the rest of the drawing – i.e. Not parallel to the drawing itself. Increments of 15° are advised.



Finally, your Instruction text can be centred to the reference line, or it can sit above the reference line. The text should be a least twice the line thickness above the reference line. The text should never touch the reference line itself.



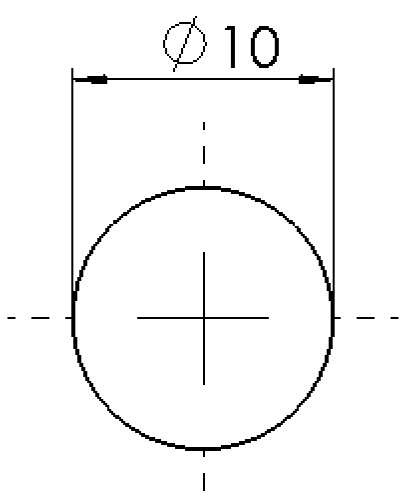
Question 5?

(a) A scale of 1:500 means that everything is in reality 500 times bigger. So 1 cm in the drawing is 500 cm = 5 m in reality.

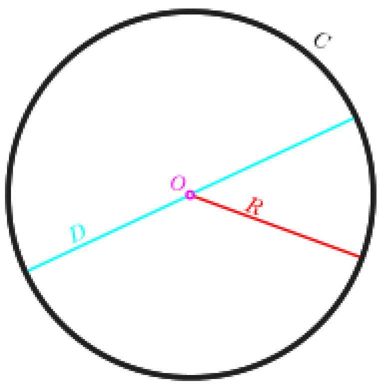
In some rare cases the drawing is bigger than the reality. For example a louse that is shown enlarged in a biology book. The first number is still for the drawing and the second for the reality. A scale of 5:1 means that everything is in reality five times as small. In other words: 1 cm in the drawing is 0.2 cm in reality.

(b) n the real world, one meter is equal to one meter. A drawing at a scale of 1:10 means that the object is 10 times smaller than in real life scale 1:1. You could also say, 1 unit in the drawing is equal to 10 units in real life.

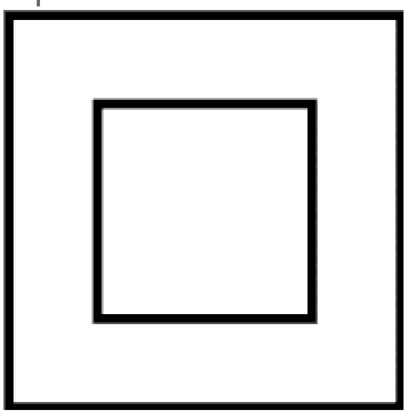
Question 6?
Diameter?



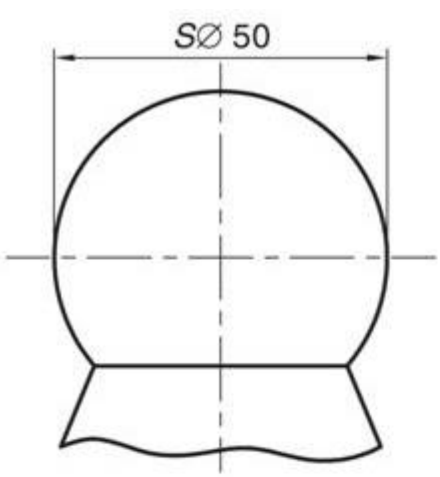
Radius?



Square?



Spherical?



CENTRE LINE – Long and short dash lines. Usually indicates centre of holes, circles and arcs. Line is thin and dark.

CUTTING PLANE LINE – Extra thick line use to show cutaway views or plane of projection where a section view is taken. Arrow indicates direction of view.

SHORT AND LONG BREAK LINES –Short and long medium line use to show cutaway view of a long section.

Question 7?

Orthographic projection is a means of representing three-dimensional objects in two dimensions. It is a form of parallel projection, in which all the projection lines are orthogonal to the projection plane, resulting in every plane of the scene appearing in affine transformation on the viewing surface. The obverse of an orthographic projection is an oblique projection, which is a parallel projection in which the projection lines are *not* orthogonal to the projection plane.

The term *orthographic* is sometimes reserved specifically for depictions of objects where the principal axes or planes of the object are also parallel with the projection pla but these are better known as *multiview projections*. Furthermore, when the principal planes or axes of an object in an orthographic projection are *not* parallel with the projection plane, but are rather tilted to reveal multiple sides of the object, the projection is called an *axonometric projection*. Sub-types of *multiview projection* include *plans*, *elevations* and *sections*. Sub-types of *axonometric projection* include *isometric*, *dimetric* and *trimetric projections*.

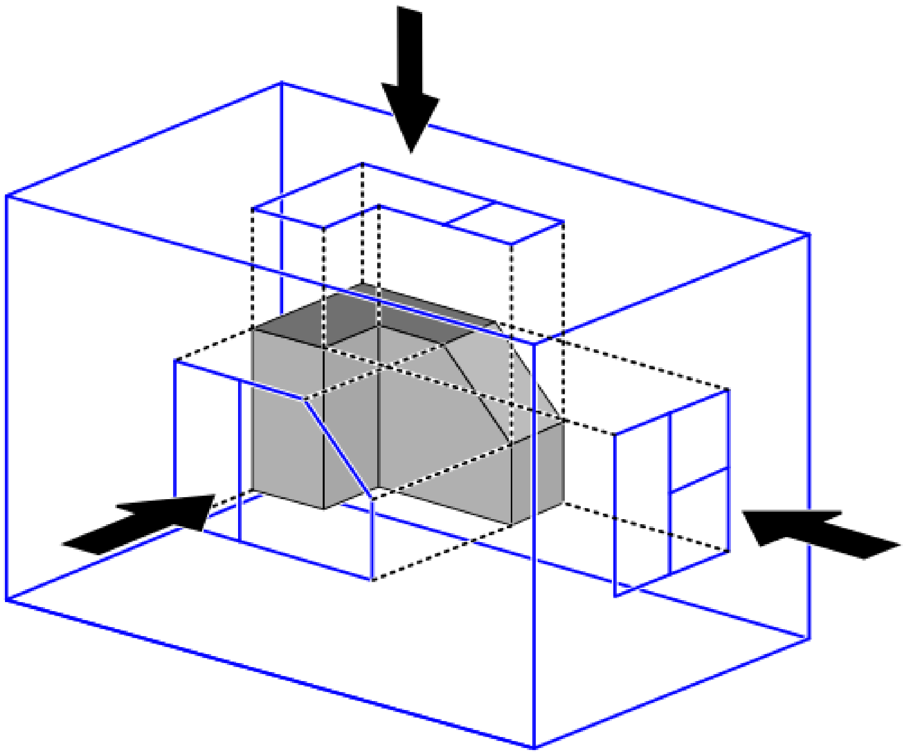
Question 8?

Orthographic projection, common method of representing three-dimensional objects, usually by three two-dimensional drawings in each of which the object is viewed along parallel lines that are perpendicular to the plane of the drawing. For example, an orthographic projection of a house typically consists of a top view, or plan, and a front view and one side view (front and side elevations).

Question 9?

First angle projection?

This is one of the most common methods used to obtain engineering drawings, mostly for orthographic projections. Orthographic projection is a graphical method used to represent three-dimensional structures or objects into different perspective projection images called views. The orthographic view typically consists of the top view, front view, and the side view. First angle projection is one of the methods used for orthographic projection drawings and is approved internationally except the United States. In this projection method, the object is placed in the first quadrant and is positioned in front of the vertical plane and above the horizontal plane.



Third angle projection?

This is another perspective projection method used to represent three-dimensional objects using a series of two-dimensional views. In third angle projection, the 3D object to be projected is placed in the third quadrant and is positioned behind the vertical plane and below the horizontal plane. Unlike in first angle projection where the plane of projection is supposedly opaque, the planes are transparent in third angle projection. This projection method is mainly used in the United States and Japan stipulates the use of third angle projection schema for industrial designs for product fabrication.

Objective?

1. a

2. b

3. c
4. b
5. a
6. b
7. c
8. b
9. a
10. a
11. c
12. b
13. b
14. c
15. d