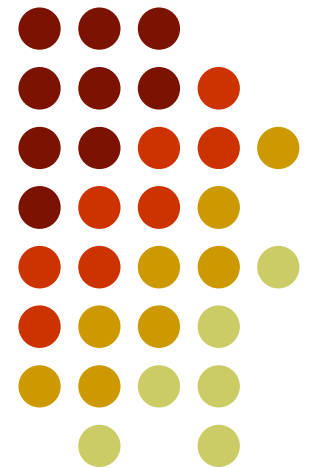


Building Construction & Graphics AutoCAD

Lecture-2B

Setting a New Drawing &
Different Coordinate Systems



AutoCAD



Contents

- ❑ Setting up a New Drawing.
- ❑ Understanding Different Coordinate Systems.
- ❑ Drawing Lines and Rectangles Using Different Methods.

Setting up a New Drawing



Defining Drawing Units

The first step after starting a new drawing is to set its *limits* and *unit type*.

Units are set through the *Drawing Units* dialog box.

Drawing units dialog box can be opened by one of the following methods:

- Format → Units
- Type *units* in Command Line → Press Enter
- Type *un* in Command Line → Press Enter

Setting up a New Drawing



Defining Drawing Limits

One can specify the area of drawing, also called the limits. The drawing limits are the outer edges of the drawing, specified in X,Y coordinates.

The limits define an artificial and invisible boundary of the drawing. However, one can draw outside the limits.

Setting up a New Drawing



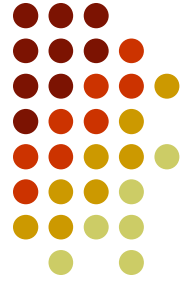
Defining Drawing Limits

Limits are set through the *LIMITS COMMAND*.

Limits command can be started by one of the following methods:

- Format → Drawing Limits
- Type *limits* in Command Line → Press Enter

Setting up a New Drawing



Defining Drawing Limits

After defining the Limits it is required to Zoom All the view. This will bring the full area within the display window.

To zoom all the view do one of the following

- View → Zoom → All
- Type *z* in Command Line → Enter → *a* → Enter
- Click *Zoom All Button* from *Standard Toolbar*.

Coordinate Systems

Cartesian Coordinate System



In UCS icon the arrow marked X points along the positive direction of X-axis. This means that as you go in the direction of the arrow, the X coordinates increase. Similarly the arrow marked Y points along the positive direction of Y-axis.

Every point on the screen can be specified using X and Y coordinates. This is called a *Cartesian coordinate system*.

Coordinate Systems



Cartesian Coordinate System

For Cartesian coordinates place the X coordinate first, then a comma (but no space), and then the Y coordinate. By default, the intersection of the X, Y axes is 0,0. Use negative numbers for points to the left of the X axis or below the Y axis.

Cartesian coordinates are of two types

- Absolute Cartesian coordinates
- Relative Cartesian coordinates

Coordinate Systems

Cartesian Coordinate System



a) Absolute Cartesian coordinates

When an object is drawn by entering the actual coordinates, such as a line from point 3,2 to 6,9, these are known as absolute Cartesian coordinates. *Absolute coordinates are measured from 0,0.*

Coordinate Systems



Cartesian Coordinate System

b) Relative Cartesian coordinates

Relative coordinates specify the X and Y distance from the immediate previous point. They are called relative because they are measured relative to a point previously specified.

To specify relative coordinates @ symbol is used before specifying X and Y coordinates.

In relative Cartesian coordinates origin is immediate previous point.



Coordinate Systems

Cartesian Coordinate System

b) Relative Cartesian coordinates

After specifying a starting point following syntax is used to specify the relative coordinates of next point:

$@X, Y$

it can be $@X, Y$ or $@-X, Y$ or $@X, -Y$ or $@-X, -Y$

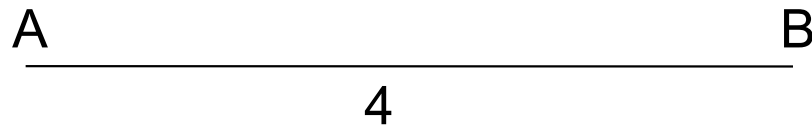
When you specify a positive number, the direction is positive. However, if you want to draw a line in the negative direction of an axis, type a minus sign before the number.

Coordinate Systems



Cartesian Coordinate System

b) Relative Cartesian coordinates



For a line AB, 4 units long, if A is starting point then relative Cartesian coordinates of point B will be as follows

@4,0

Coordinate Systems



Polar coordinates

Another common situation is to draw a point whose length and angle from either 0,0 or a previous point is known. In this case, polar coordinates are used, which can be either absolute or relative. Most commonly, relative polar coordinates are used.

Polar coordinates take the form *distance*<*angle*. (To type the angle symbol, use the less-than symbol on your keyboard.)



Coordinate Systems

Polar coordinates

@ symbol is used to specify the relative polar coordinates.

There is **NO** *comma (,)* with polar entries.

@50<45 is correct

@50,<45 is wrong

Coordinate Systems



How to input fractional distances

When typing architectural units, partial inches are indicated by fractions in the form a/b. You need to separate the fraction from the whole inches by a *hyphen*. This can be a little confusing because the hyphen is also used for negative numbers. For example, to draw a horizontal line of 5 1/4 inches in the negative direction of the X axis, type -5-1/4,0.