

VISOKA TEHNIČKA ŠKOLA
STRUKOVNIH STUDIJA
BEOGRAD

SEMINARSKI RAD

-KOMPJUTERSKO PROJEKTOVANJE-

Mentor:

dr.xxxxxxxxxxxxxxxxxx

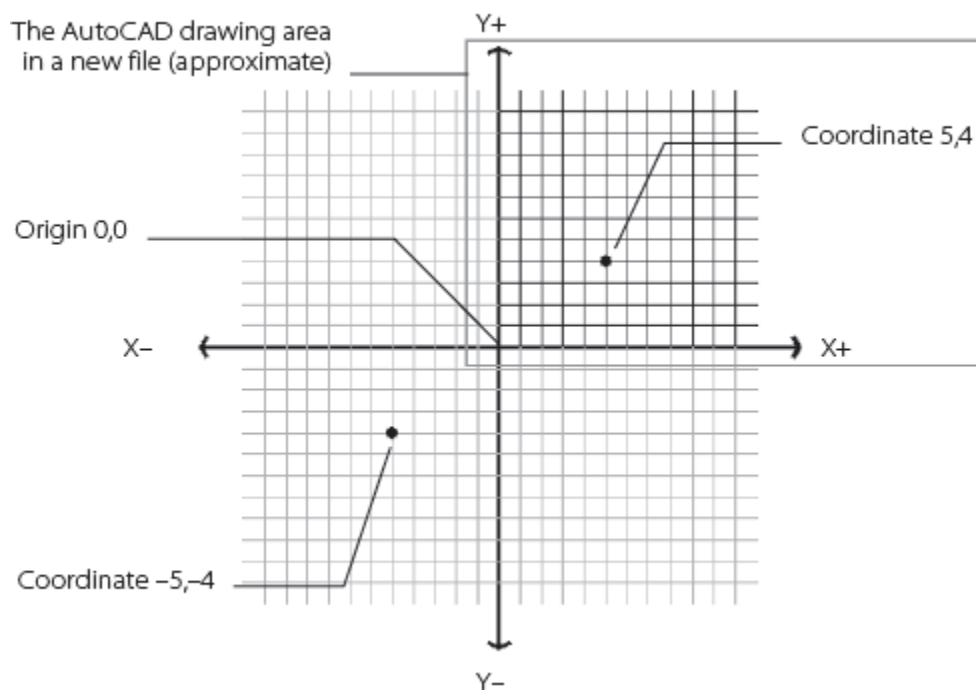
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xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

br.indeksa xxx/xx

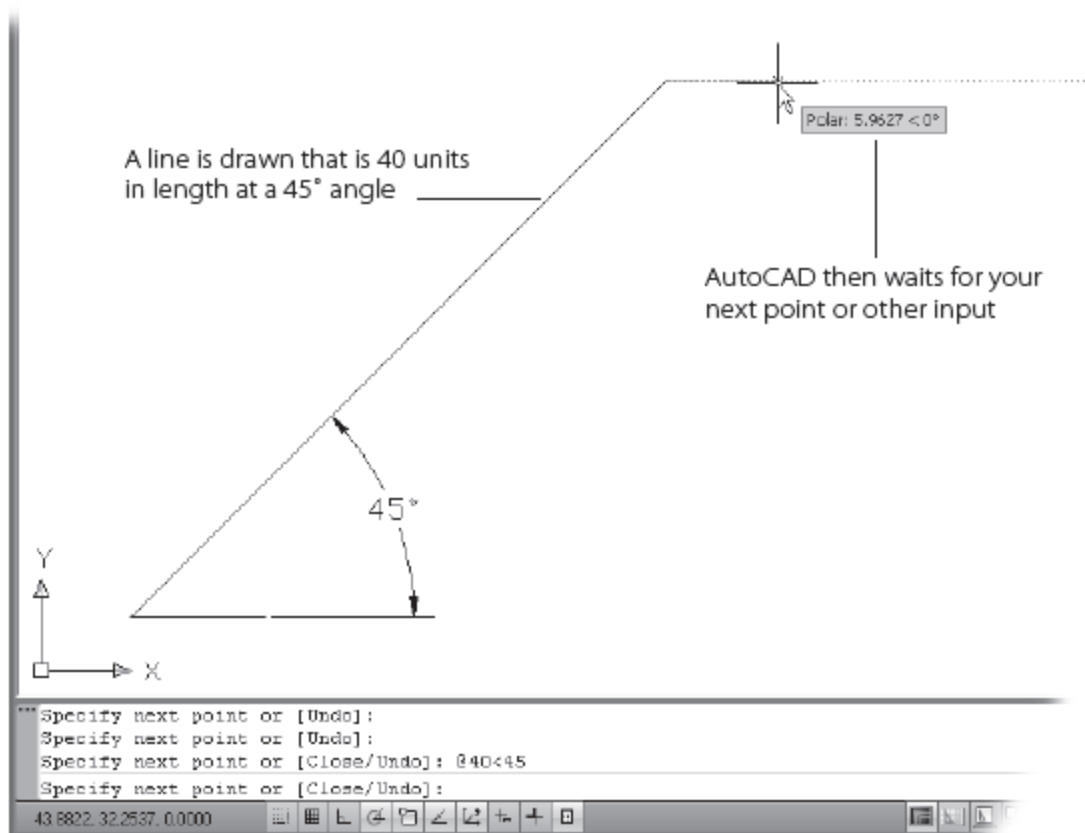
Beograd,2009.godina



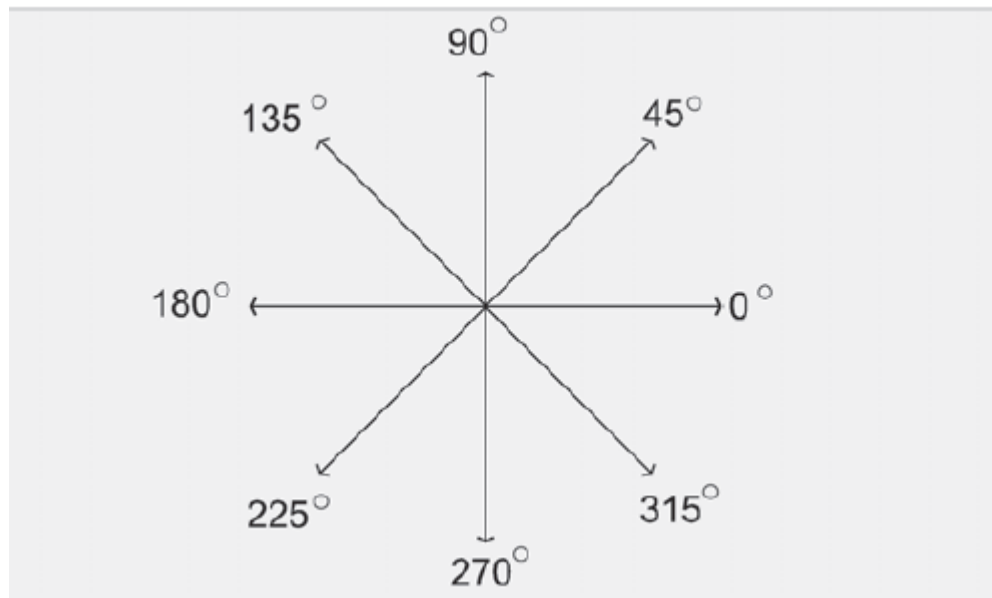
RAZUMEVANJE KOORDINATNOG SISTEMA

U novom crtežu AutoCad pokazuje pozitivno X i Y rangirane po koordinatama 0,0 koje su smeštene u koordinatnom početku u donjem levom uglu prostora za crtanje. Mnoge od komandi traže od vas da izaberete lokaciju za unos tačke. Na primer, ako počnete u komandnoj liniji videćete sledeći natpis- Odredite prvu tačku. Možete odrediti tačne koordinate odvojene zarezom. Prvo zadajete X koordinate a potom Y koordinate. Na primer, unesete vrednost za X da je 5 i za Y da je 4 - 5,4. (prikazano na gornjoj slici). Ako hoćete da uključite u sve ovo i Z osu vaše koordinate će izgledati na sledeći način-(za 3 D lokaciju)- 5,4,2; Kada unosite koordinate na ovakav način kaže se da koristite apsolutne koordinate. Ali u većini slučajeva, to nećete činiti. Koristićete **Relative** koordinate. Odredićete razdaljinu i pravac od odabrane tačke na crtežu.

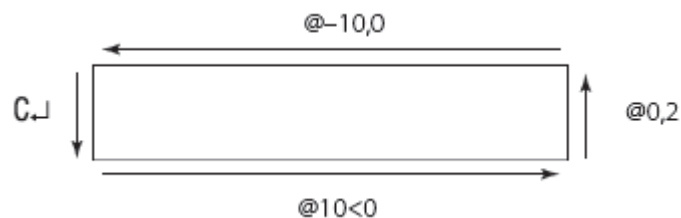
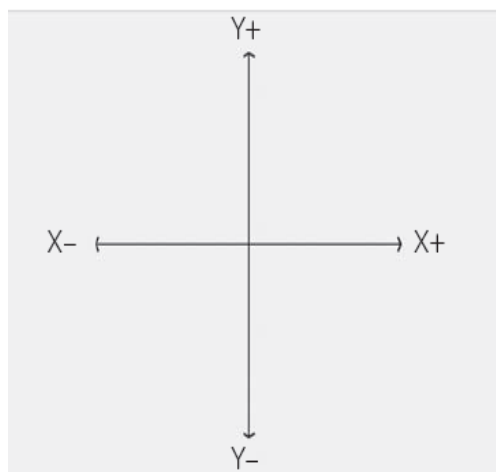
Željene koordinate morate započeti znakom @ koji znači- od poslednje selektovane tačke. Na primer, unete komandu Line a zatim znak @ i potom vrednost 3 za X osu- a 0 za Y. To će izgledati ovako- @ 3,0 Ovom komandom se AutoCadu daje naredbe da je data tačka tri jedinice na X osi i 0 na Y osi. Sledeći način za unos koordinata su **Polarne** koordinate. Sa njima vi određujete razdaljinu ali i ugao. Na primer, hoćete da vam odabrana tačka bude na razdaljini 40 od prethodne tačke i pod uglom od 45°, unosite komandu @ 40<45.



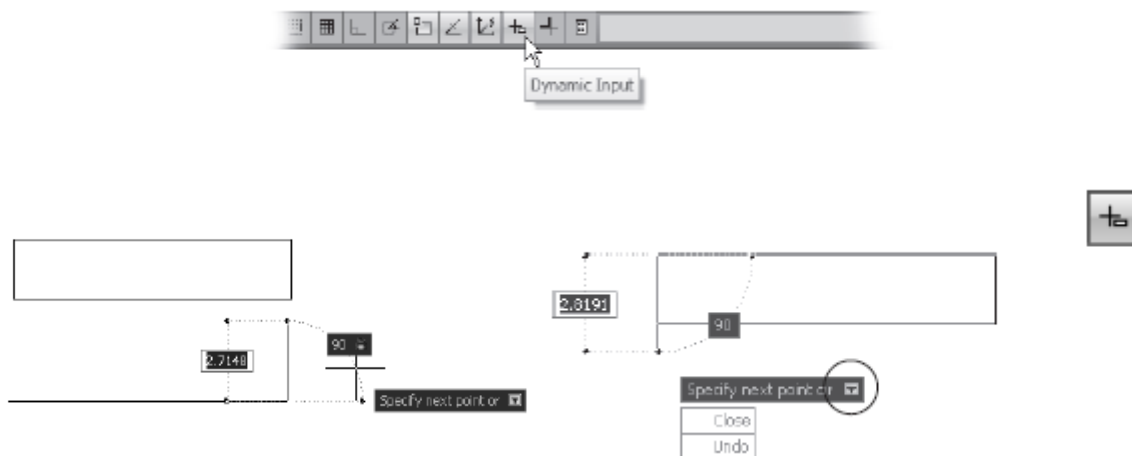
Uglovi su dati u sistemu koji je prikazan na sledećoj slici, u kojem je 0° horizontalan pravac s leva na desno, 90° je pravo gore, 180° je horizontalno s desna na levo, i tako dalje. Možete odrediti stepene, minute i sekunde luka ako želite toliku tačnost.



Određivanje relativnih Kartezijanskih koordinata se vrši na taj način što se unose vrednosti koje mogu biti i pozitivne i negativne za X i za Y. Na primer, ako unesemo @ -10,0 to znači da se naša tačka nalazi od prethodno unete tačke deset jedinica levo a po Y osi ona miruje tj. na nuli je. Pozitivne vrednosti u ovom sistemu idu sleva na desno i od dna prema vrhu, a negativne obrnuto.



Korišćenje Dinamičke opcije- Mnogi korisnici ne žele da gube vreme dok crtaju i da gledaju u komandni prozor, što im omogućava uključivanje Dinamičke opcije koja prati kursor i istovremeno pokazuje i razdaljinu i uglove, u odnosu na kretanje kursora.

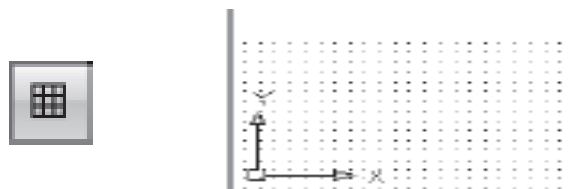


Orto mod- prinuđuje kursor da se kreće ili vertikalno ili horizontalno.

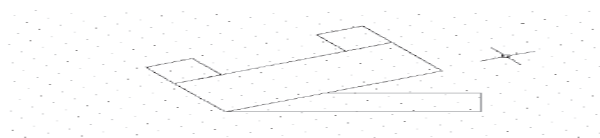
Polar-traking - je mnogo fleksibilniji nego Orto mod zato što ne primorava kursor da se strogo drži horizontale ili vertikale a pri tome drži orijentaciju prema željenom uglu.



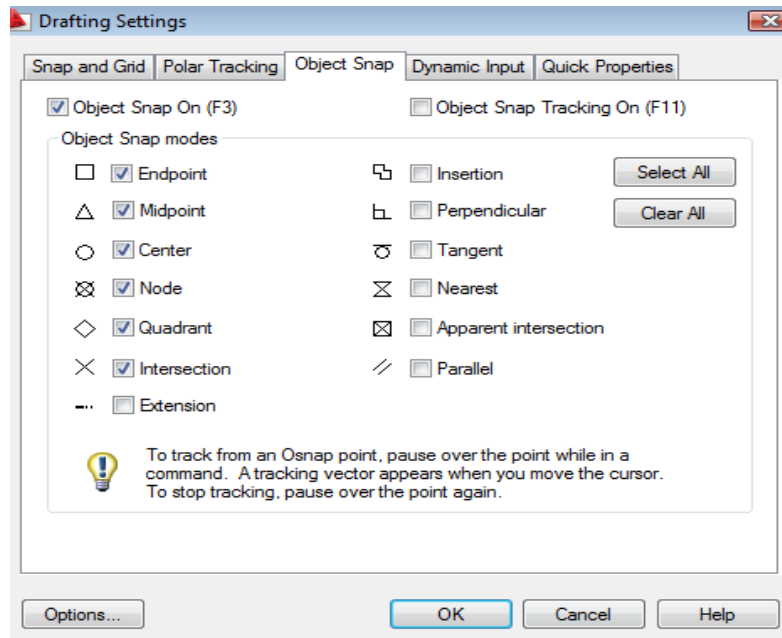
Grid mod – pomaže u određivanju distance i orijentacije u kombinaciji sa **Snap modom** kada se kursor kreće skokovito u odnosu na broj zadatih jedinica.



Rotiranje Grida, Snapa i kursora- je ponekad vrlo korisno, za određeni ugao. Ne samo da se rotirara Grid, već isto tako i Snap i kursor zajedno.

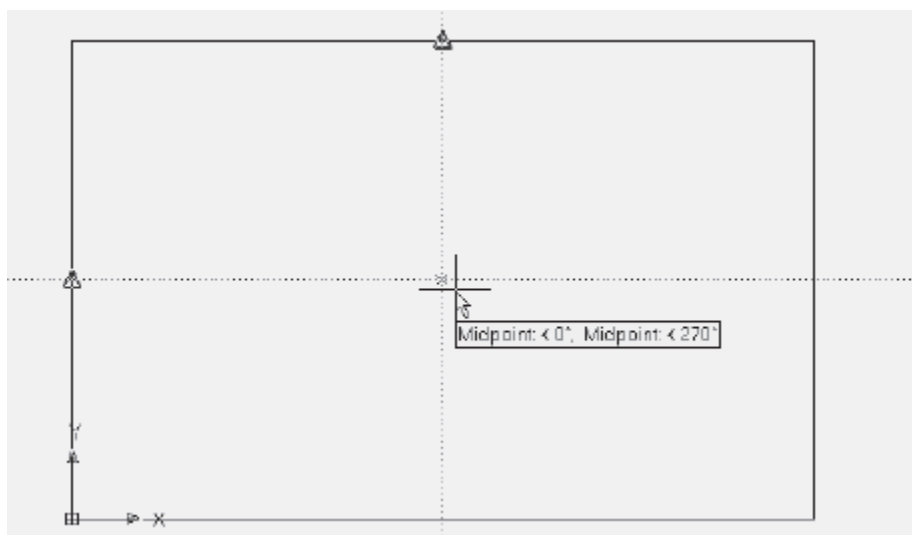


Osnap kriterijumi

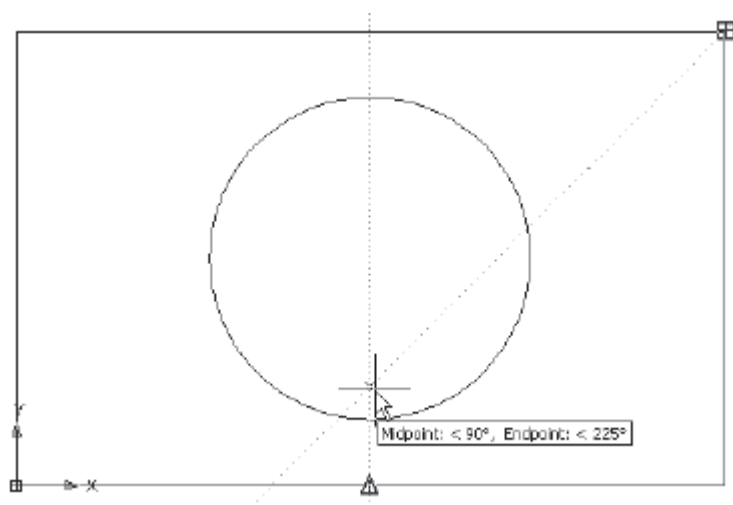


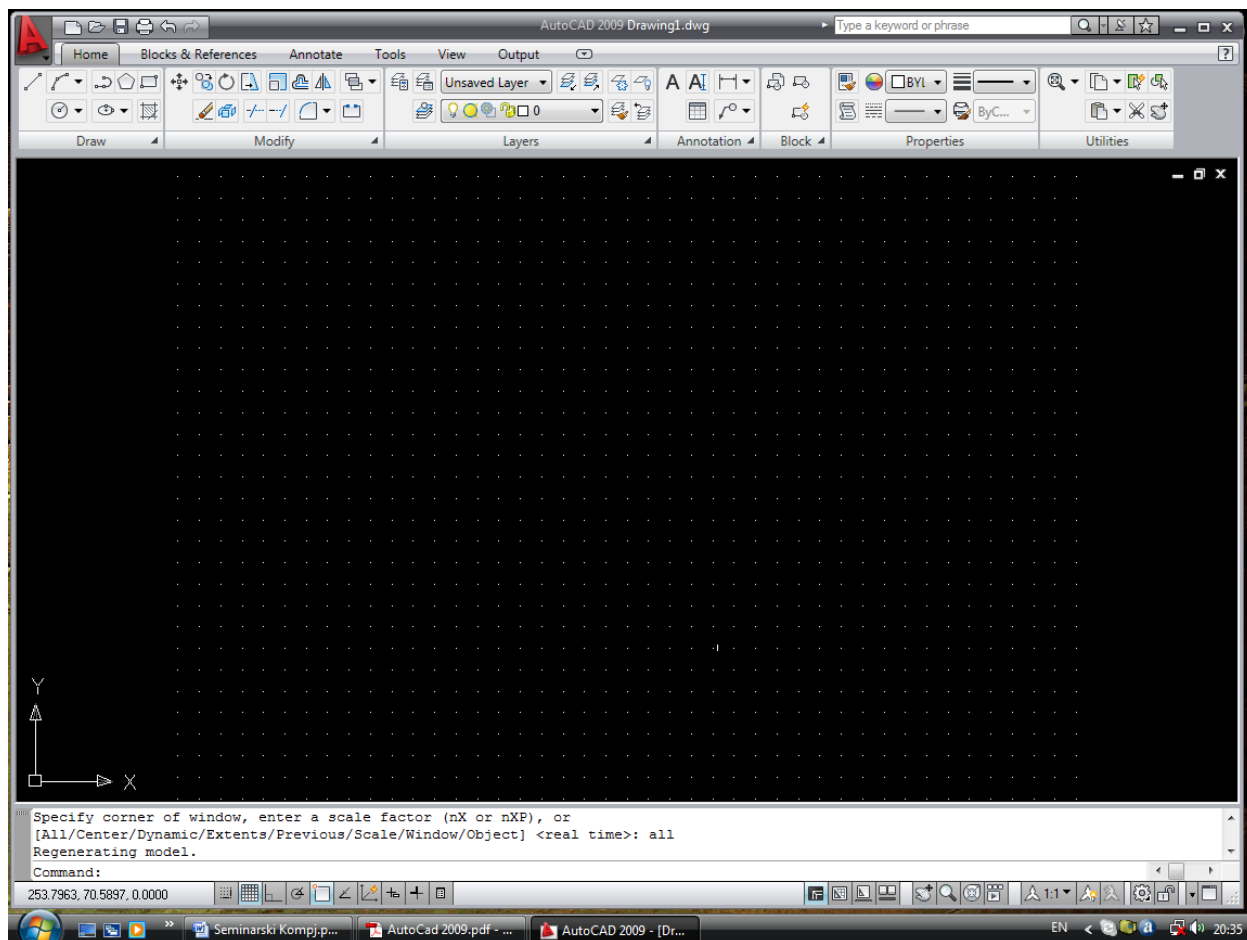
Endpoint-precizno vezivanje za krajnju tačku, Midpoint-pogađa se redišnja tačka, Center-centar luka ili kruga, Perpendicular- za crtanje normale na prethodno izabrani objekat, Quadrant- ovim kriterijumom se pogađaju 4 karakteristične tačke kružnice ili elipse, Intersection- presečne ili dodirne tačke, Tangent- pogađa se tačka koja se nalazi na tangenti objekta, Nearest- zadavanje tačke na objektu koja je najbliža kursoru, Extension- prouzrokuje privremeno produžavanje linije ili kruga tako da se može definisati željena tačka, Insertion- ubacivanje željenog teksta i sl., Parallel- formira paralelne objekte...

Korišćenjem Polar trakinga možemo uz ove kriterijume tačno da odredimo centar željenog kruga na primer na radnom crtežu.



Ili Osnap traking sa Polar trakingom zajedno...

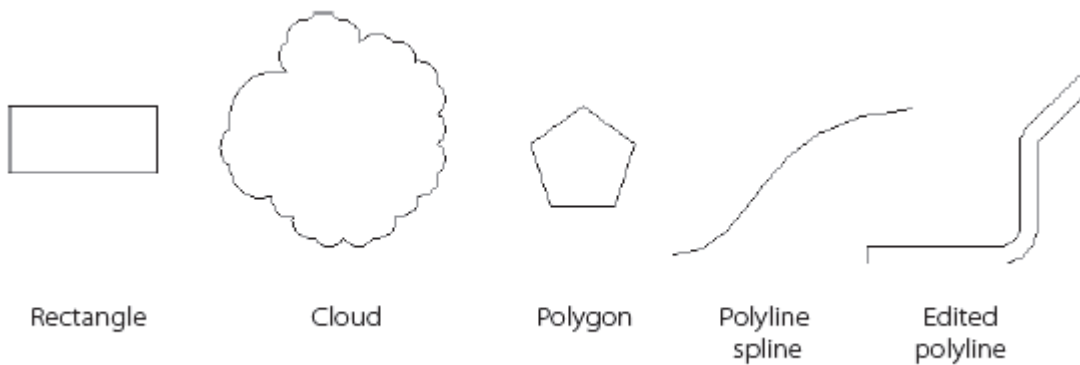




Izgled jednog otvorenog radnog crteža u AutoCadu 2009- sa menijima

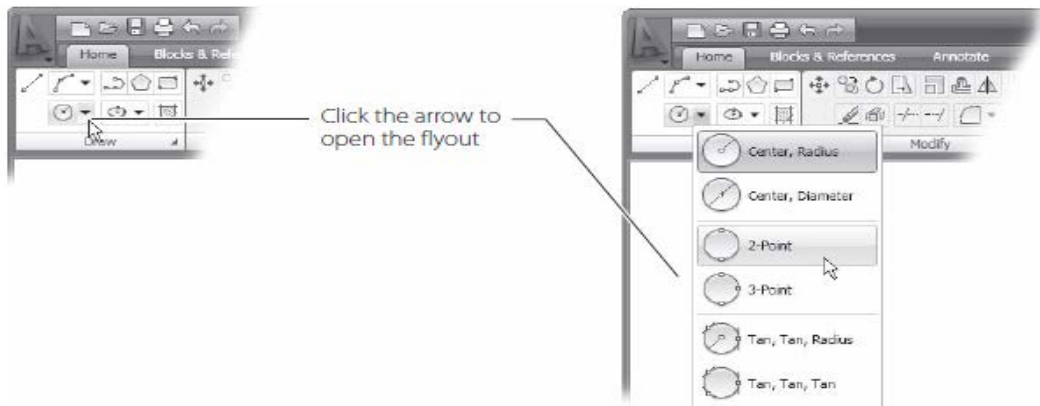
Rad sa panelom za crtanje



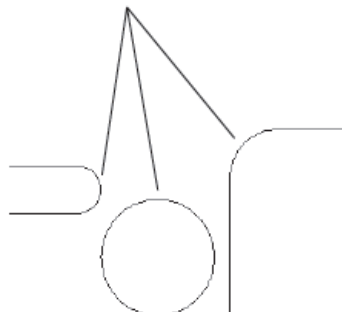


Sigurno je da nećete samo nacrtati **liniju** i ostaviti je tako. Ona je samo početak. Neke od najčešće korišćenih komandi su Trim, Extend, Fillet i Offset. Korišćenjem komande **Polyline** nacrtaćete više njenih segmenata koje će na kraju predstavljati jedan objekat. Pravougaonik je pravi primer za to.

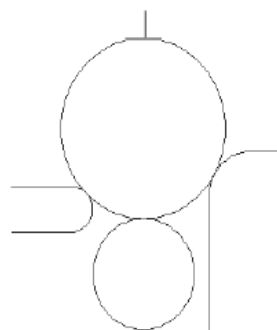
Crtanje krugova i lukova



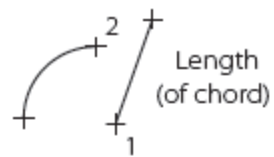
Use the 3P option in the Circle command, and then use the Tangent osnap to select these locations.



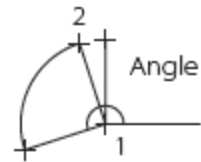
The circle is drawn tangent to the arcs and the circle.



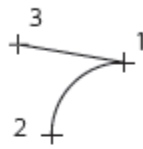
Crtanje lukova



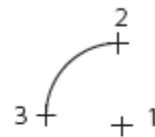
Center, Start, Length



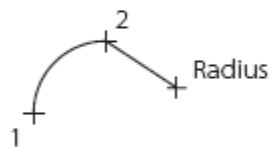
Center, Start, Angle



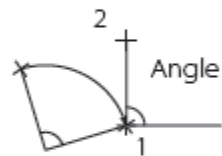
Start, End, Direction



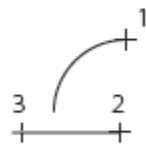
Center, Start, End



Start, End, Radius



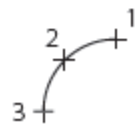
Start, End, Angle



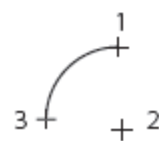
Start, Center, Length
(of chord)



Start, Center, Angle

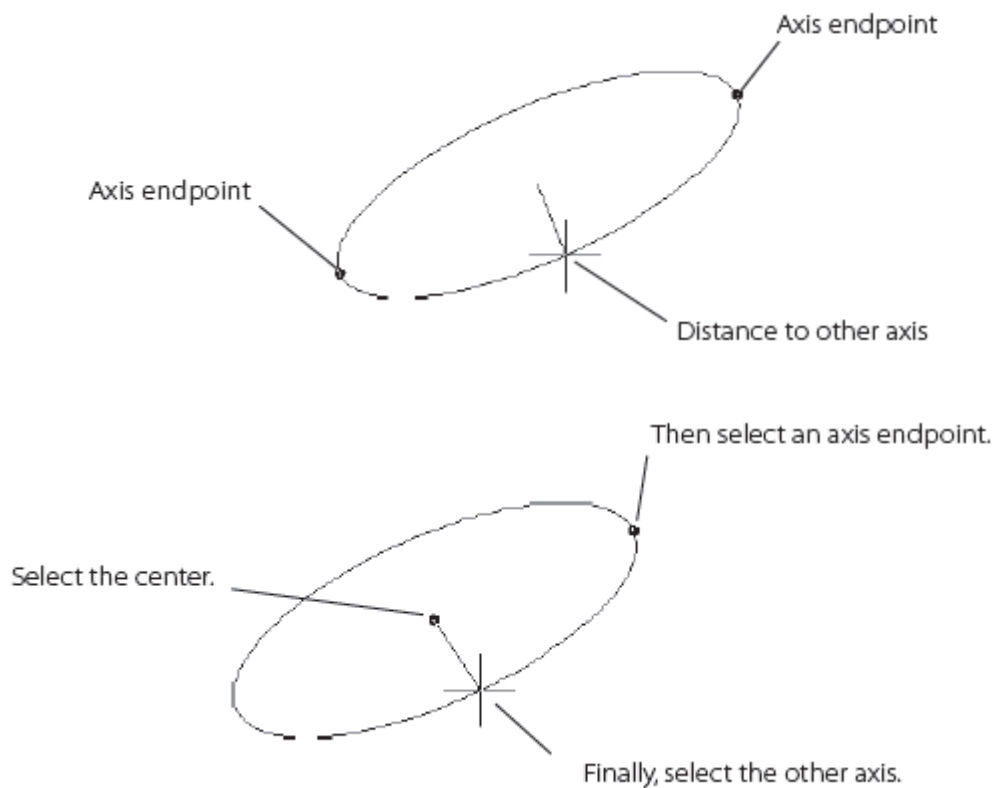


3-Point

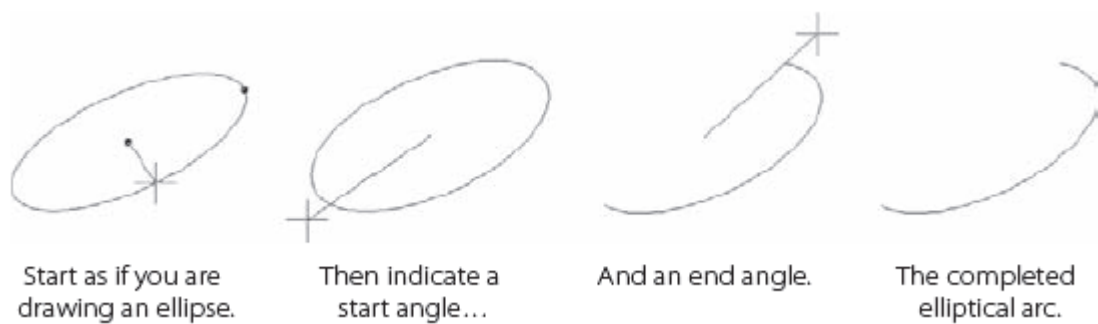


Start, Center, End

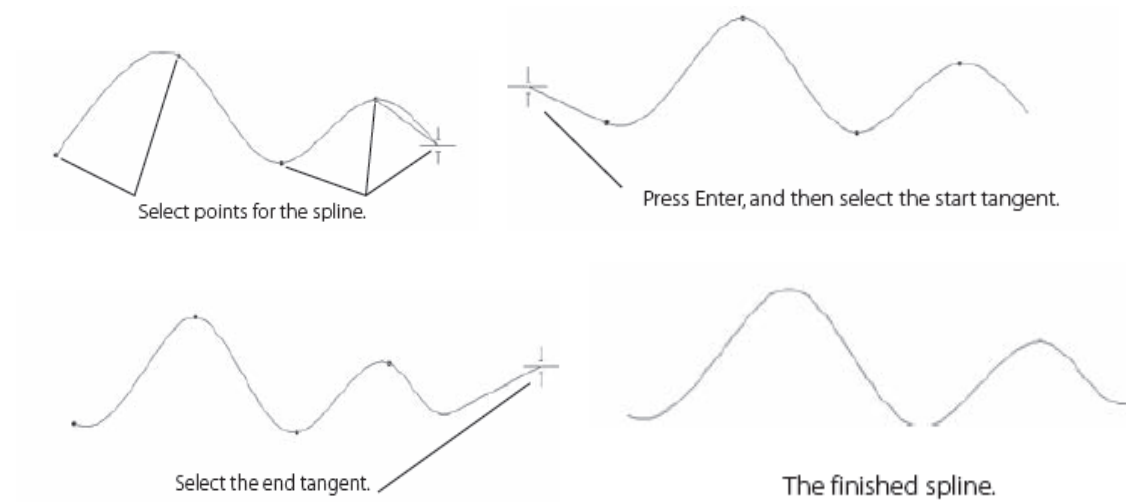
Crtanje Elipsi



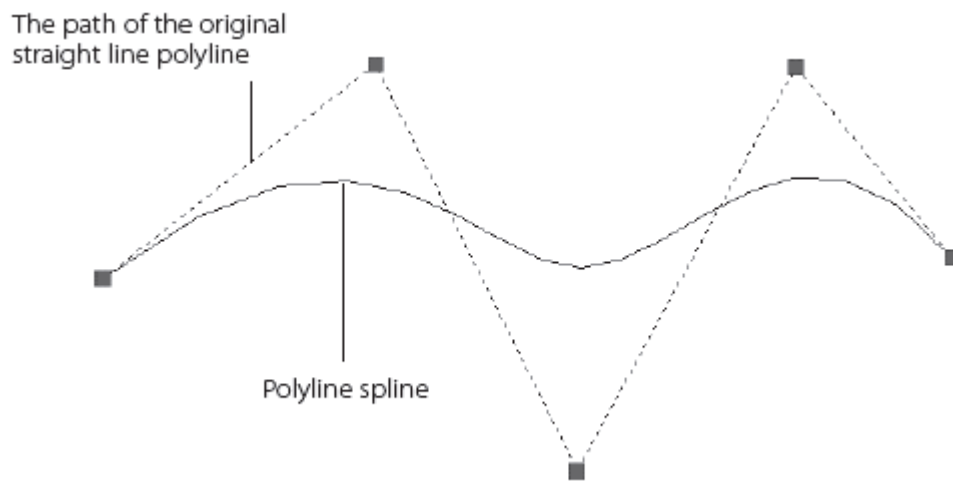
Crtanje eliptičnih lukova



Crtanje krivih uz komandu – Spline

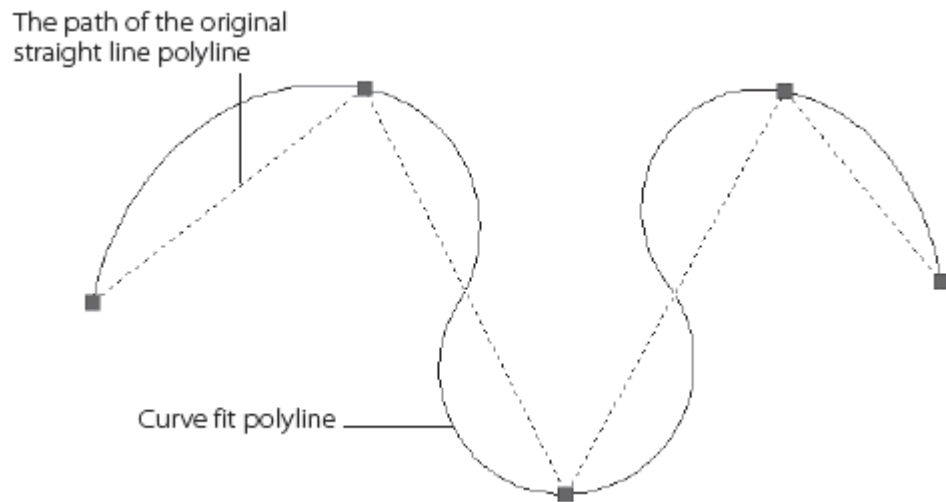


Crtanje krivih sa Polyline



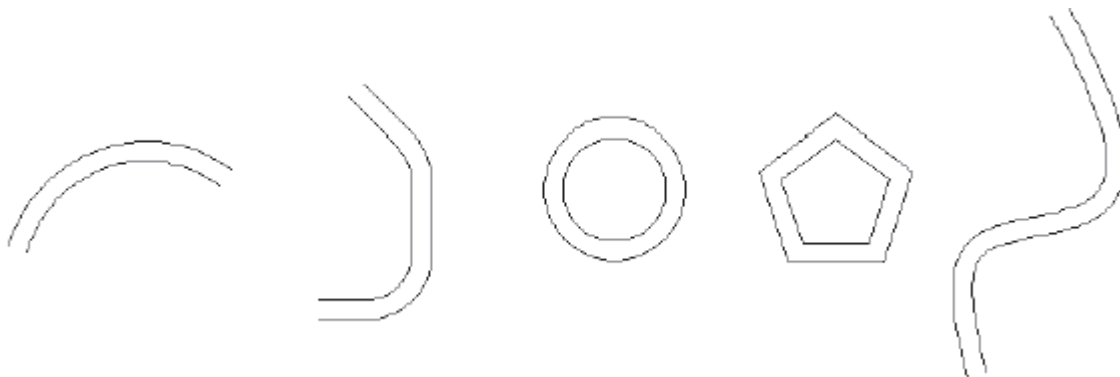
Korišćenjem komande – **Pedit**

Opcija **Fit** komande **Pedit**

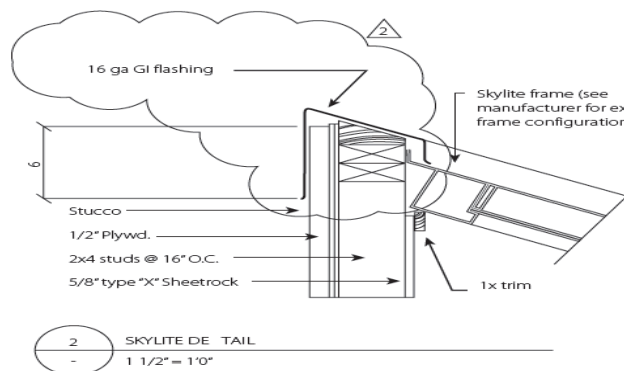


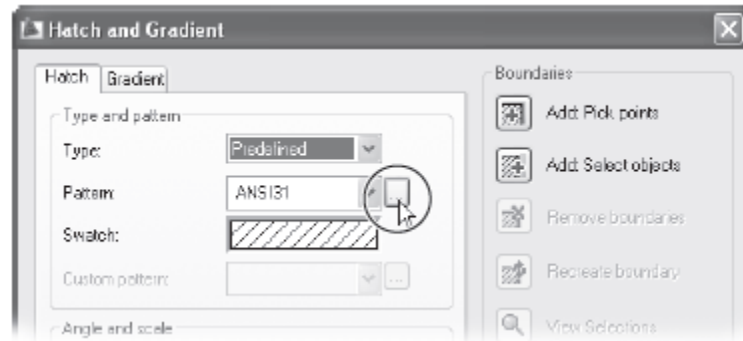
Crtanje paralelnih linija

Mogu se koristiti komande **Multiline** ili **Offset**, koja je fleksibilnija i stvara paralelne kopije.

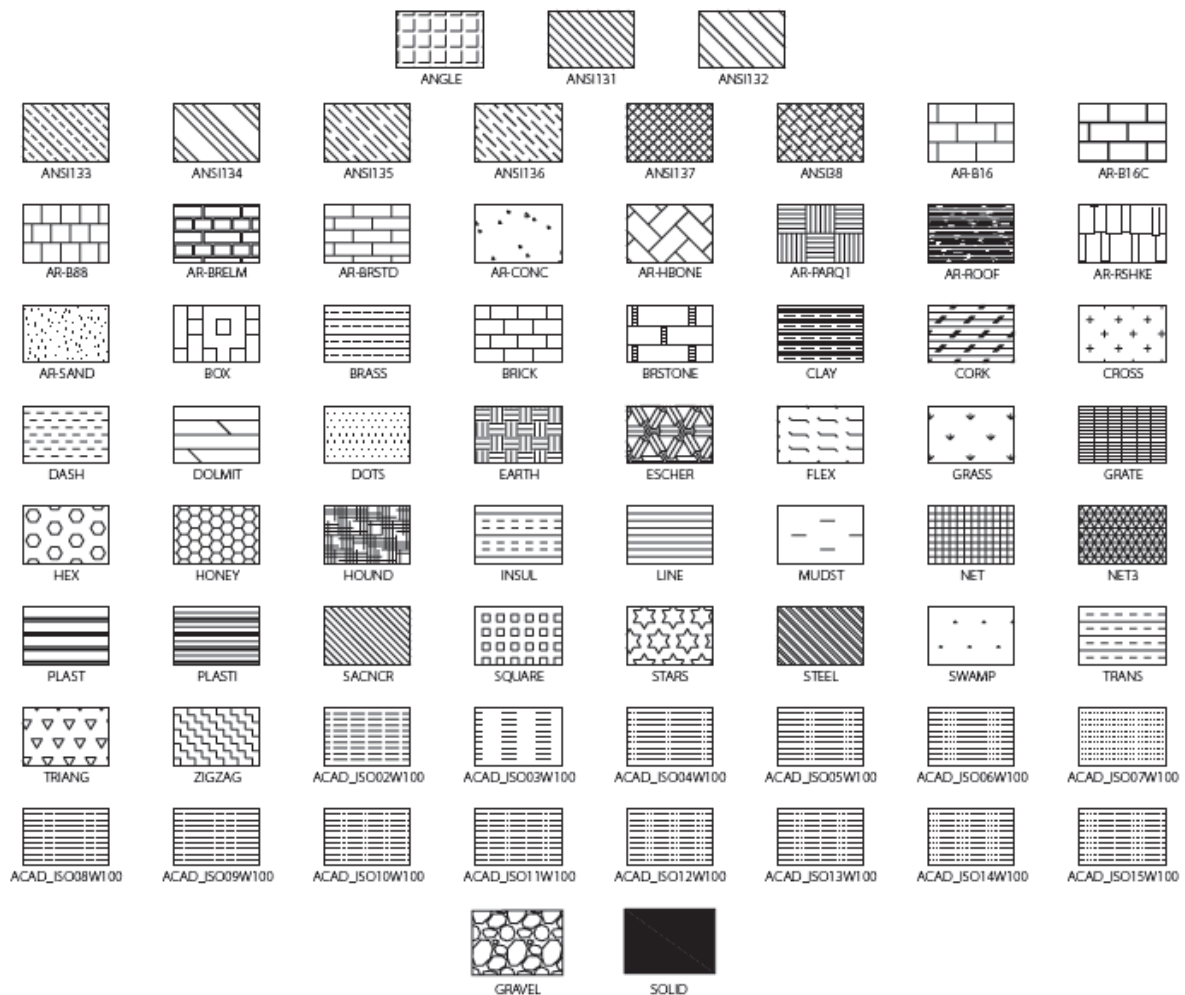


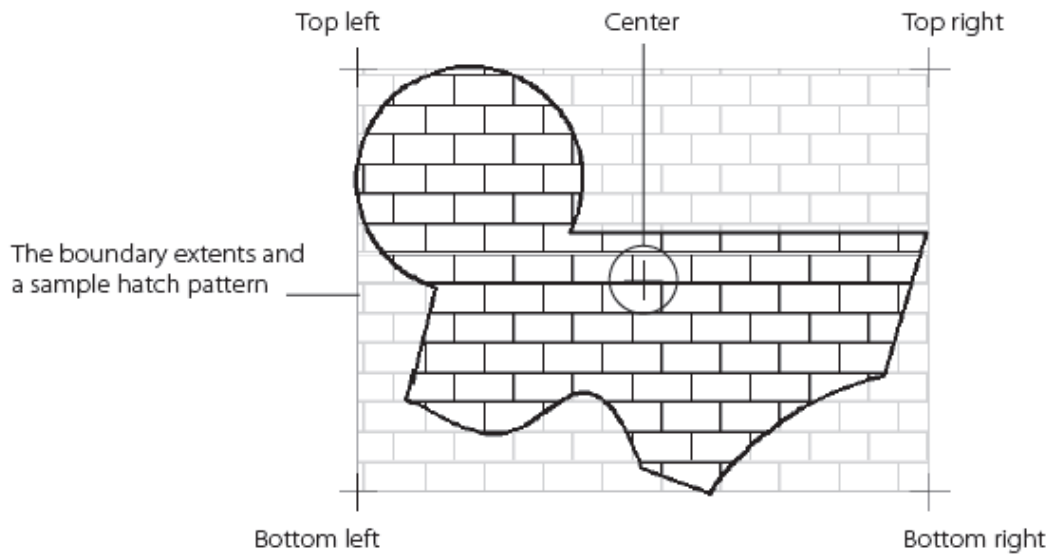
Crtanje oblačića – oni se često koriste u tehničkoj dokumentaciji jer skreću pažnju.



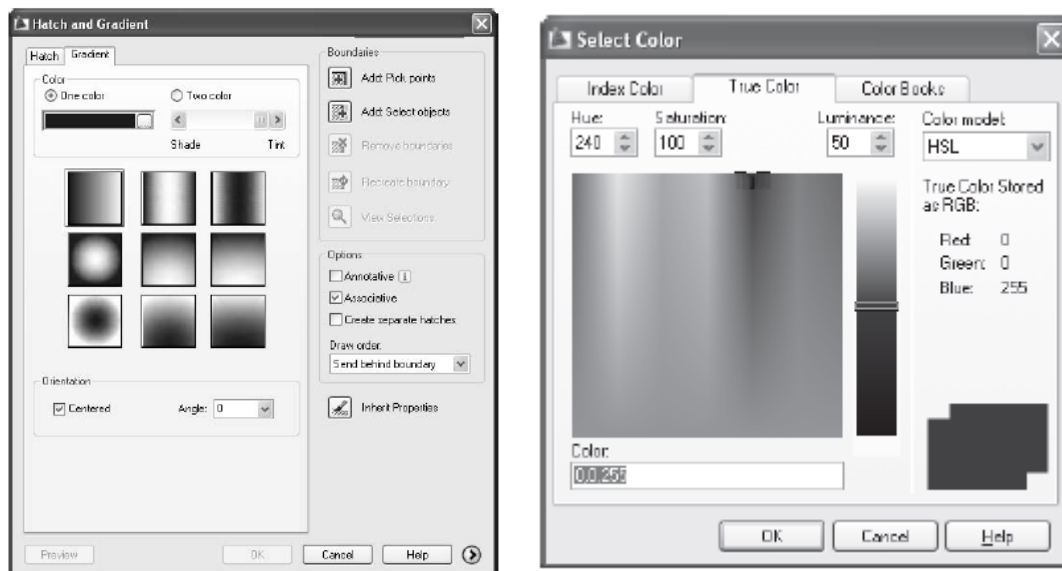


Rad sa komandom **Hatch**



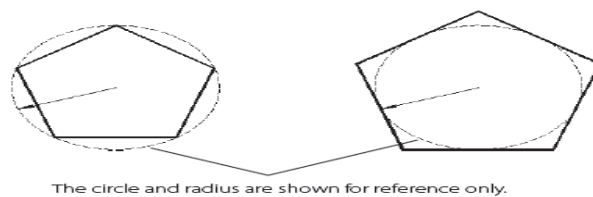


Primer mogućeg korišćenja ove komande.

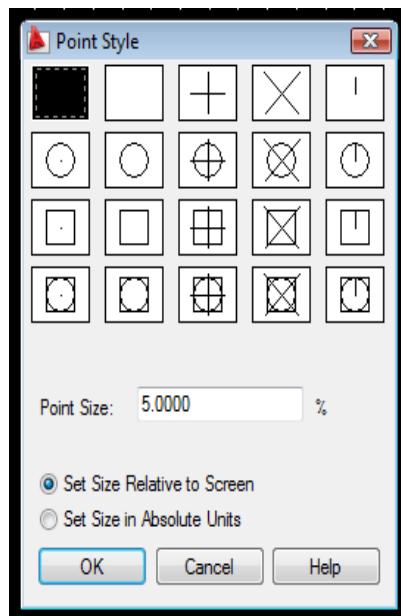


Upotreba boja i senki.

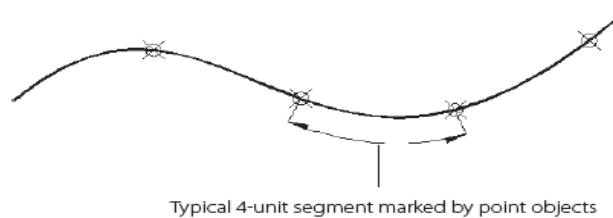
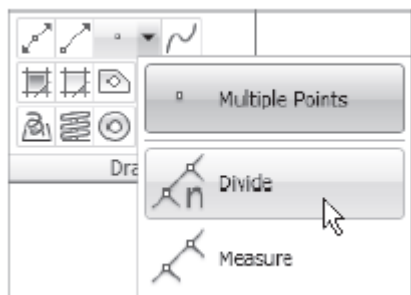
Komanda **Polygon** za crtanje petougla ili šestougla najčešće.



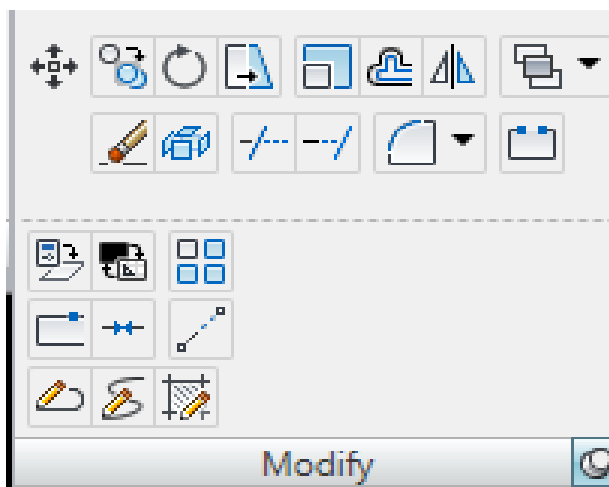
Komanda **Point** služi da bi se označila tačka na crtežu.



Komanda **Divide** za deljenje objekta na više segmenata.



Modify meni



Selektovanje objekata

Možemo koristiti sledeće komande: all, p-previous, Crossing, Crossing Polygon, Fence, Last, Multiple, Single, Remove...

Last-selektovanje poslednjeg nacrtanog elementa

Window- položaj dva suprotna ugla(temena)pravougaonika. Svi elementi koji se celi nađu unutar pravougaonika biće selektovani.

Crossing – opcija slična opciji Window, gde se vrši prividno postavljanje na ekran isprekidanim linijama. Svi elementi koji se celi nađu unutar pravougaonika ali i oni koji presecaju ivice pravougaonika biće selektovani.

Box- takođe opcija selektovanja pravougaonicima.

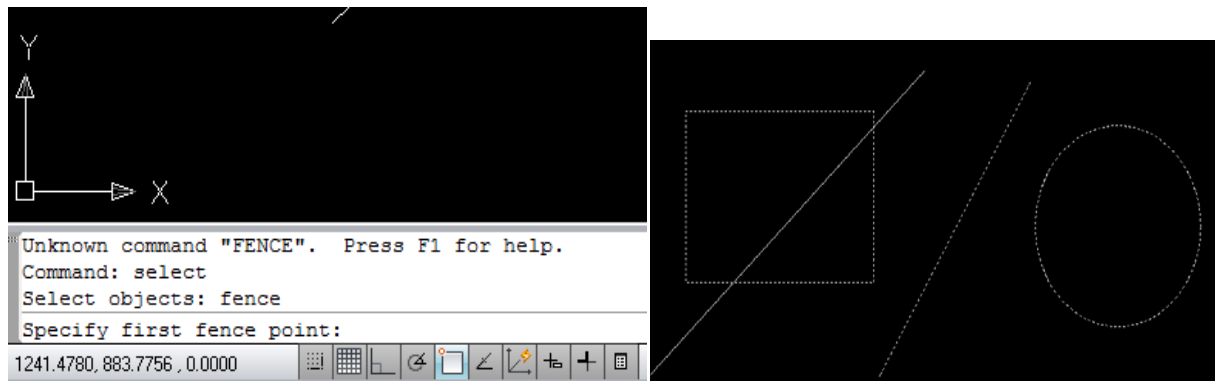
Crossing Polygon- umesto pravougaonika iscrtava se poligon.

Fence- selektovanje pomoću Fence linije, zadaje se početna i krajnja tačka linije.Svi elementi koje linija seče biće selektovani.

Multiple- višestruko pojedinačno selektovanje objekata, jednog po jednog.

Remove- opcija za deselektovanje objekata ali ne redom.

Undo- deselektovanje redom ako smo slučajno pogrešili.



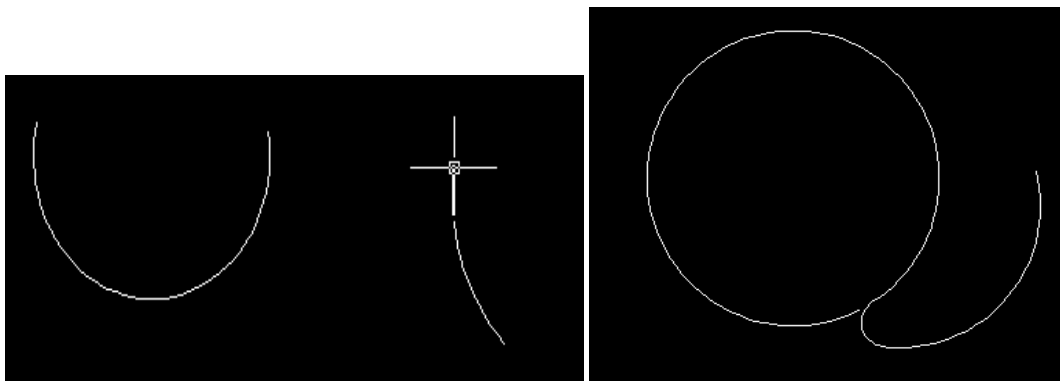
Brisanje objekata

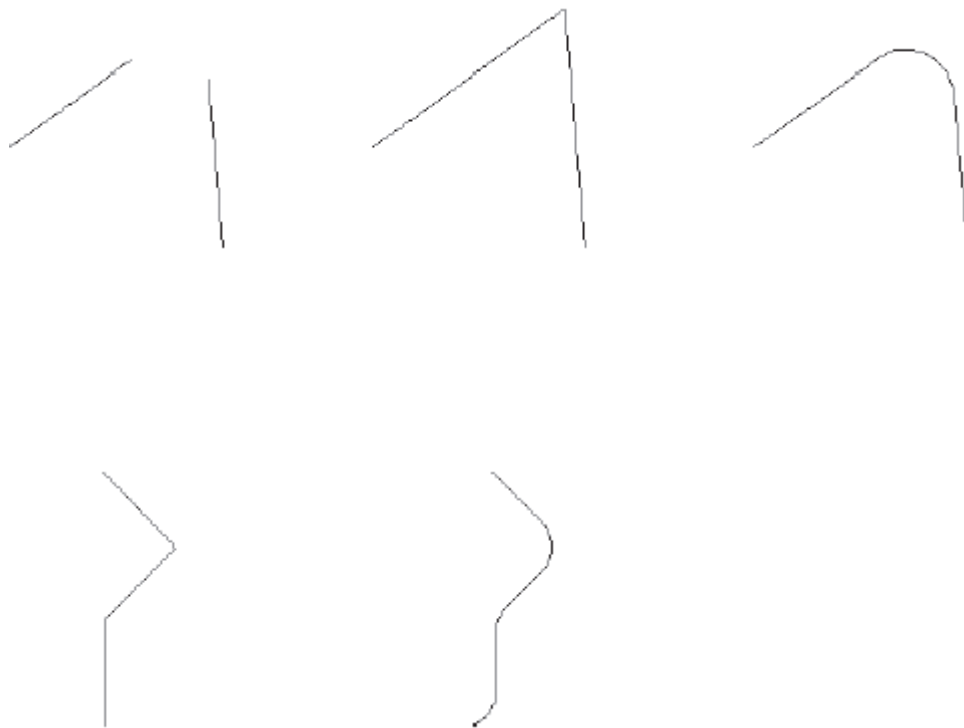
Komandom **ERASE** sa Modify menija ili preko odgovarajuće ikone iz Toolbara. Ili ako su objekti selektovani tasterom **Delete** sa tastature. Poništavanje komande Erase moguće je komandom **OOPS**. I svi objekti će opet biti nacrtani.

Spajanje objekata

Čitava ideja korišćenja AutoCada je da se crta precizno. Spajanje objekata se vrši na različite načine. AutoCad obezbeđuje različite alate za spajanje krajnjih tačaka, kao što su lukovi, linije, i polilinije. U tom smislu povezivanjem se smatra skraćivanje ili produžavanje linije, luka ili polilinije da bi sreća drugi objekat, bez remećenja orijentacije objekta.

Fillet komanda je jedna od najčešćih- ona spaja linije bez obzira gde se nalaze krajnje tačke.





Takođe se mogu zaokruživati uglovi polilinija.

Komanda je Fillet,enter,R-radijus,P-poliline...

Ako želite da dodate luk koji je tangenta dva objekta ali ne želite da trimujete, možete promeniti Trim settings Fillet komandom.

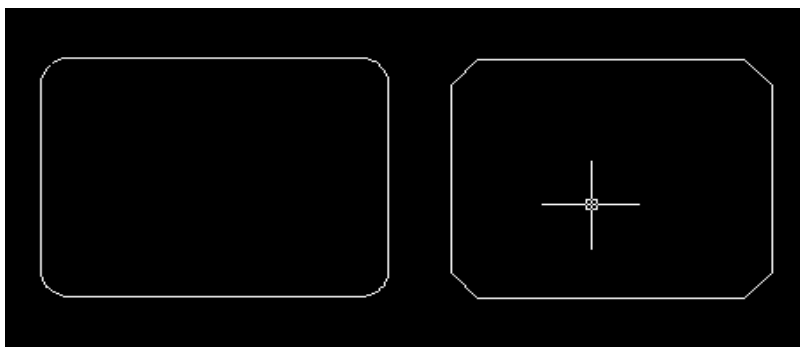
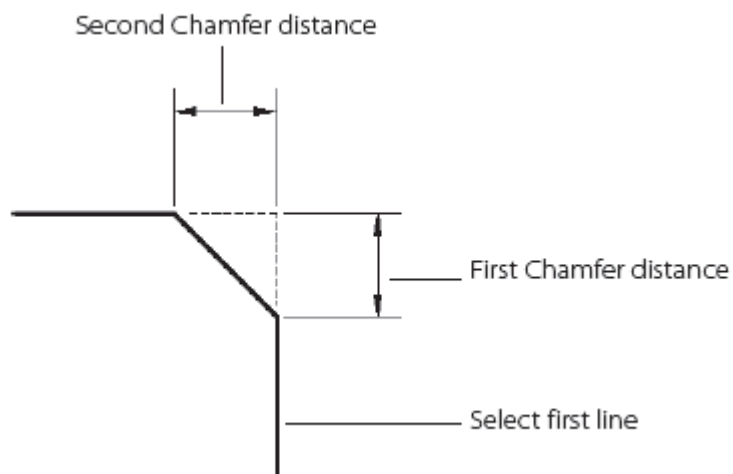


Figure 5.3
Fillet with the
No Trim setting
turned on

Komanda je Fillet,enter,T,N...



Chamfer – komanda za obaranje ivica.



Primeri dve komande Fillet i Chamfer



Select first line Primeri komadne Chamfer kod Polilinije

Extend – komanda za produžavanje objekata



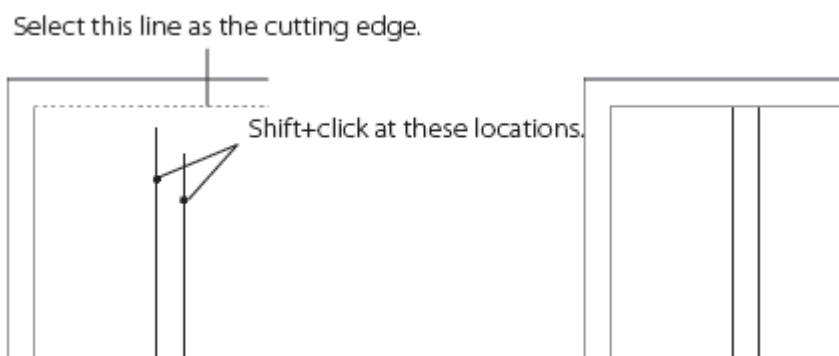
Trimovanje objekta

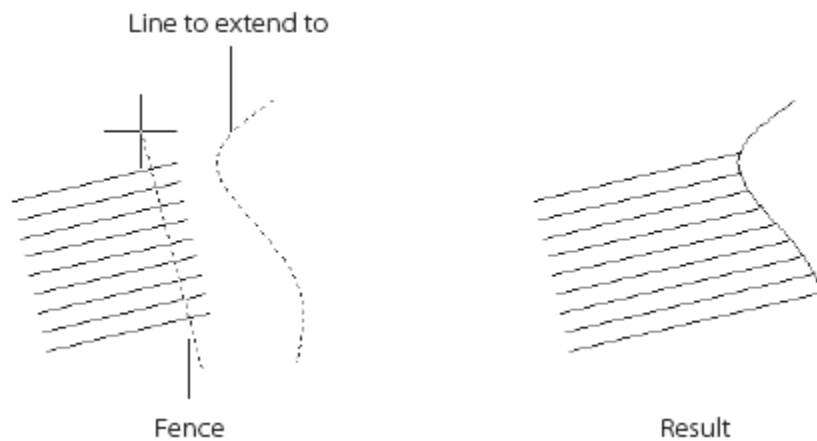


Može se koristiti Trim komanda za istovremeno trimovanje i produžavanje objekata



Produžavanje objekata

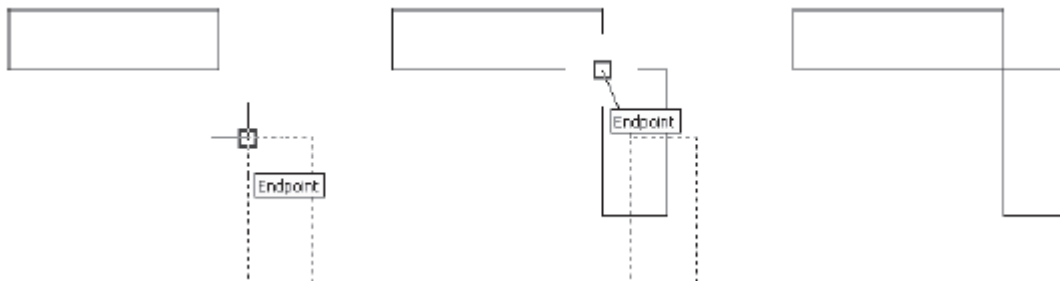




Produžavanje niza linija do objekta.

Pomeranje i kopiranje

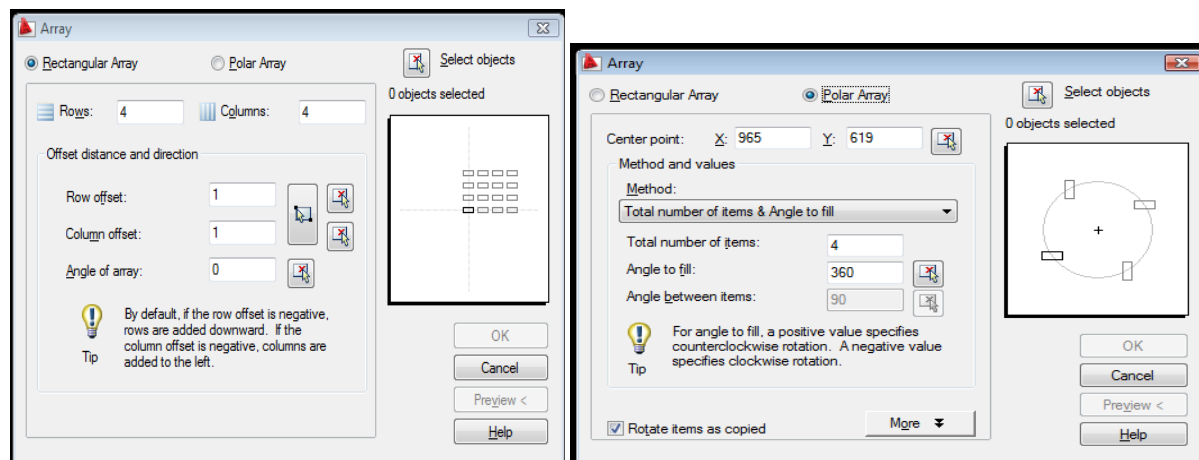
Komanda M, posle koje se traži da se odredi bazična tačka pomeranja a zatim i tačka u koju pomeramo objekat.



Korišćenje Osnap kriterijuma za pomeranje objekta u krajnjoj tački.

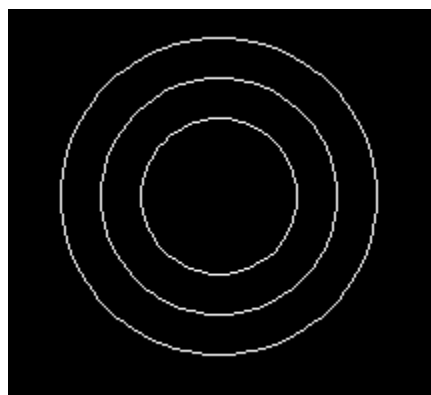
Komanda za kopiranje **Copy** je identična kao i za pomeranje objekta s time što postoji generalna razlika zato što je omogućeno da se kopiranje vrši neprestano u novostvorenoj krajnjoj tački.

Višestruko kopiranje se vrši uz pomoć komande **Array**.

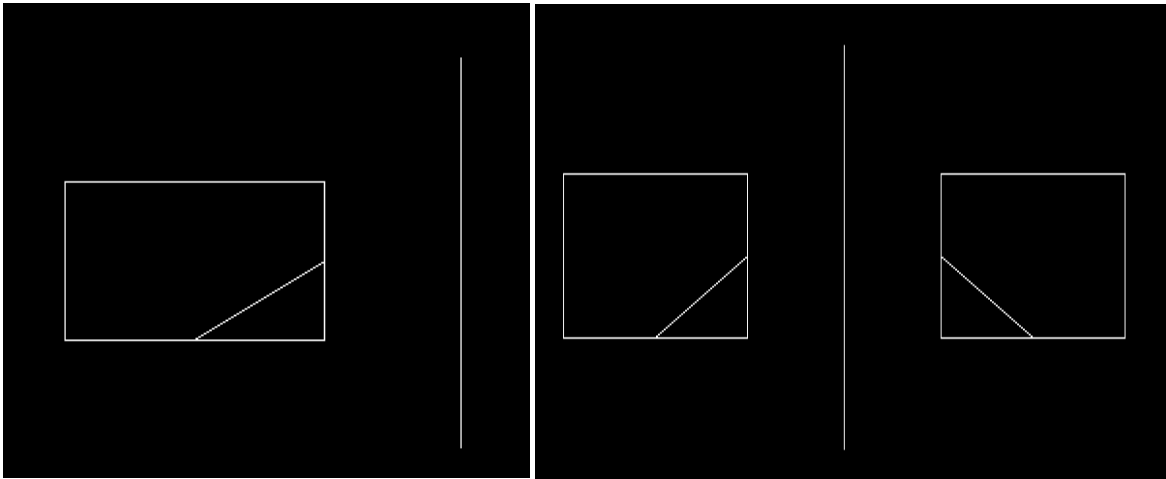


Ova komanda omogućava kopiranje jednog ili više selektovanih objekata po matričnom principu, (u redove i kolone)- opcija **Rectangular**, ili po kružnoj ili lučnoj krivini – opcija **Polar**. I u jednom i drugom slučaju možemo odrediti brojeve kolona i vrsta, razdaljinu između njih, ugao pod kojim se nalaze i broj kopija.

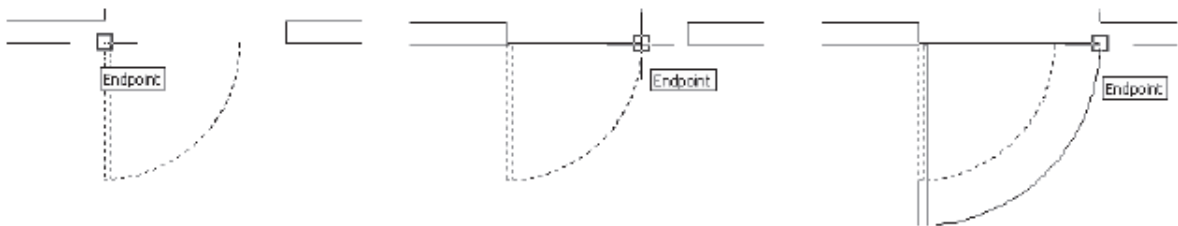
Offset- komanda za paralelno kopiranje objekta. Ima dve mogućnosti sa opcijama Distance i Through. Ako izaberemo prvu mogućnost to znači da treba da unesemo rastojanje između originala i kopije. Druga mogućnost izvršava se zadavanjem tačke položaja kroz koju će novi objekat prolaziti.



Mirror – komanda služi za osno simetrično kopiranje objekta u ravni.

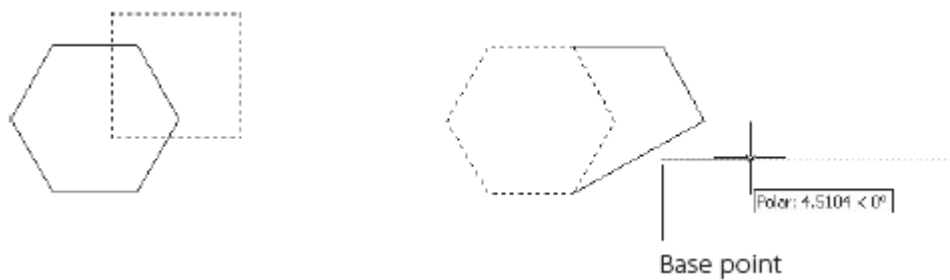


Scale- komanda služi za fizičko smanjivanje ili povećavanje objekta.

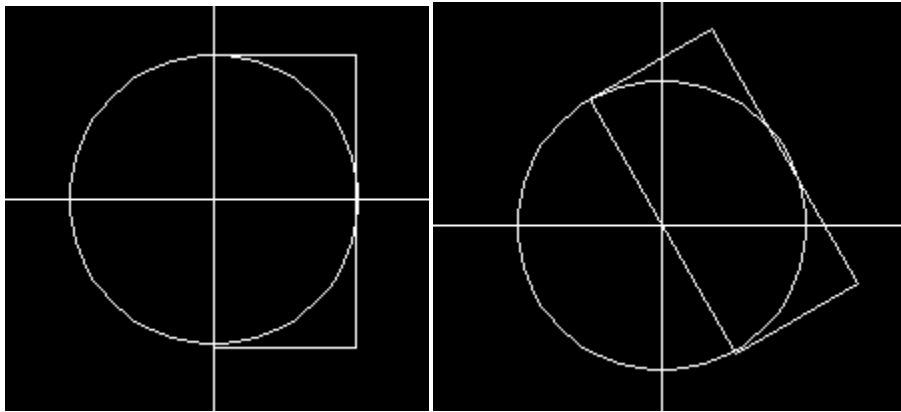


Ako su faktori veći od 1 objekti će biti uvećani toliko puta, a ukoliko su manji od 1 biće umanjeni toliko puta. Faktor 0.5 umanjuje objekat dva puta. Sa opcijom Scale-Reference tražimo položaj dve tačke koje daju referentnu dužinu.

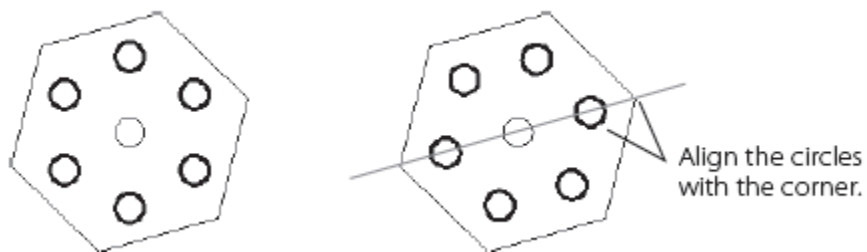
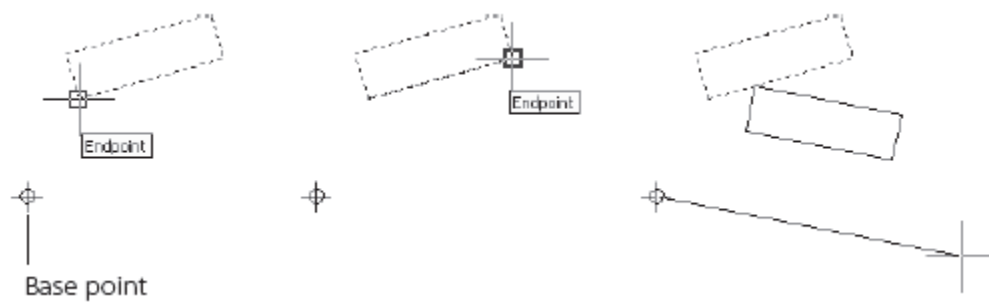
Stretch – komanda služi za razvlačenje ili sabijanje objekata.



Rotate – komanda služi za rotiranje objekata pod određenim uglom.

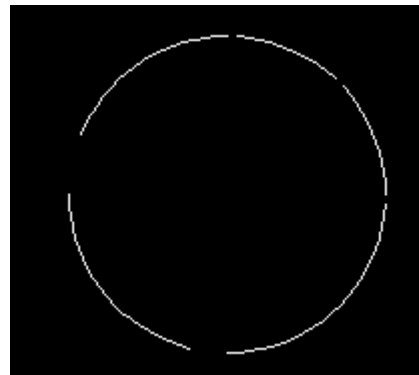
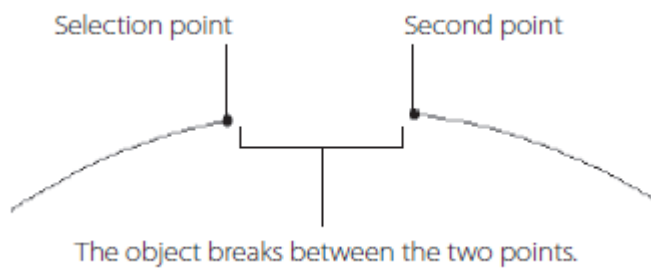


Rotiranje pravougaonika za zadati ugao od 30 stepeni.

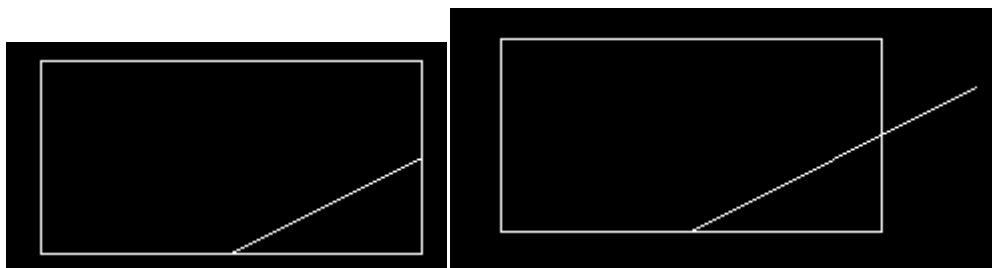


Rotiranje krugova unutar heksagona korišćenjem referentnog ugla.

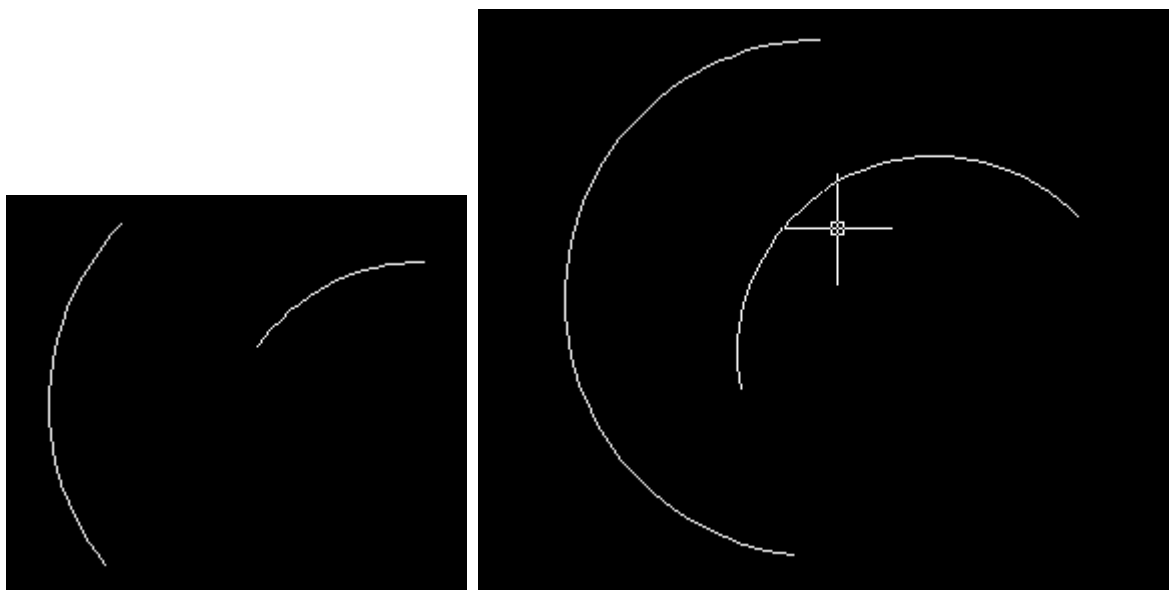
Break - komanda služi za brisanje dela objekta.



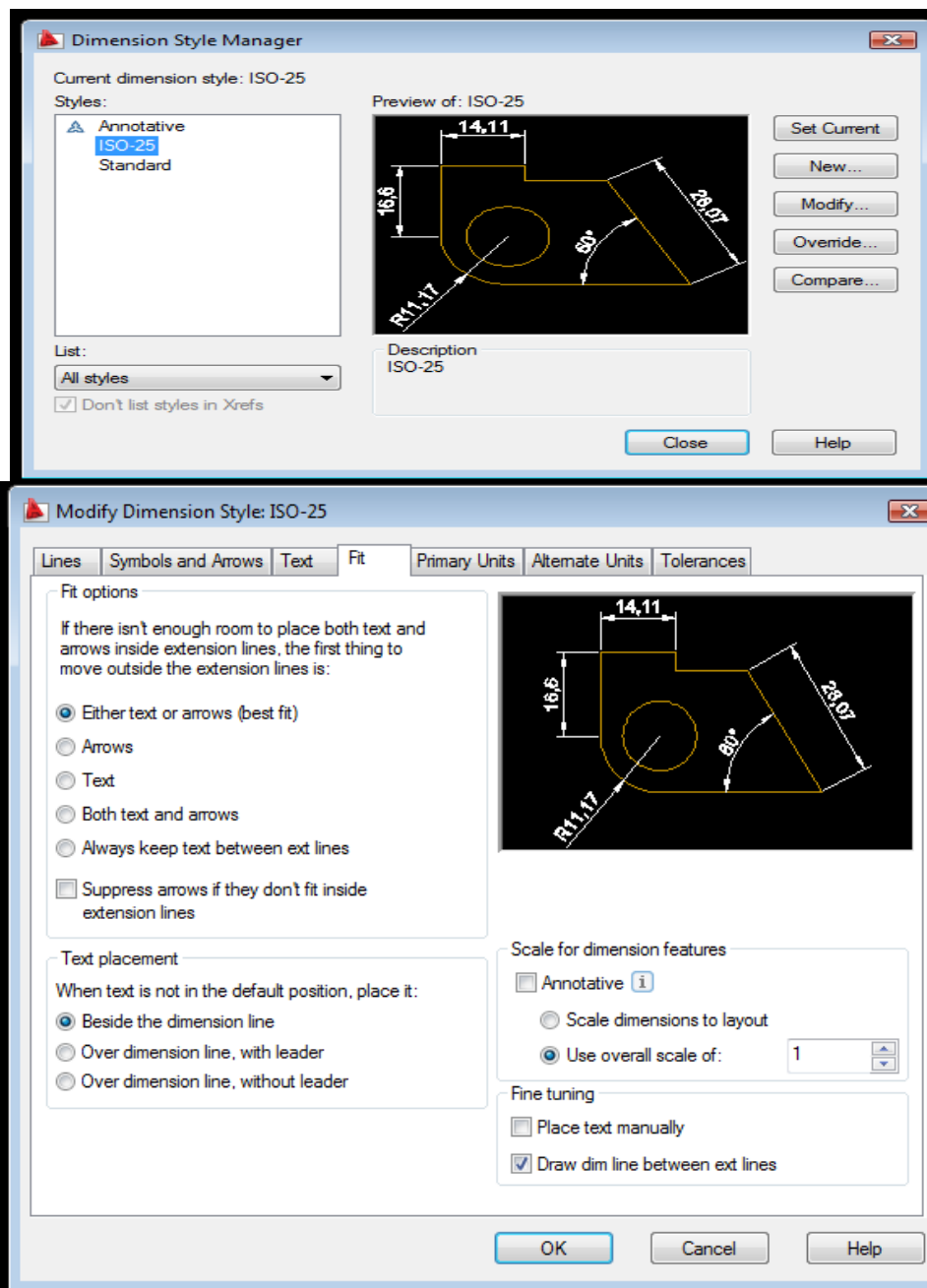
Lengthen – komanda služi za promenu dužine objekata i promenu unutrašnjih uglova lukova.



Ako ukucamo Delta opciju(DE) i zatim brojčanu vrednost za koju želimo da jedan objekat, u ovom slučaju to je linija u pravougaoniku, produžimo- ona će se produžiti u pravcu u kome bliže postavimo kursor. Kod lukova možemo izabrati opciju Angle, gde program traži priraštaj ugla.

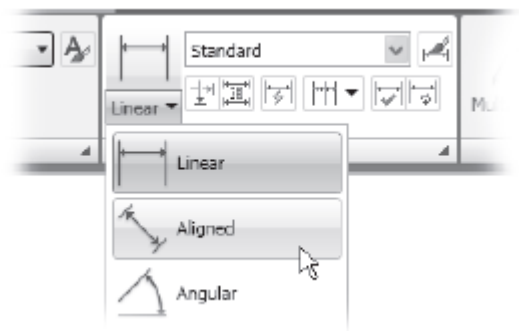
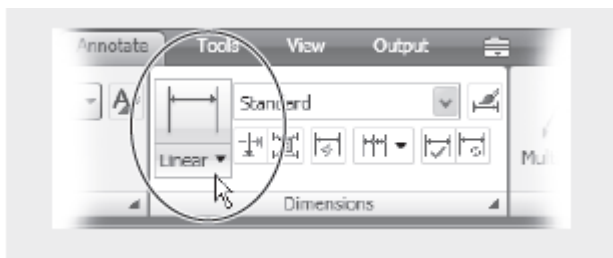
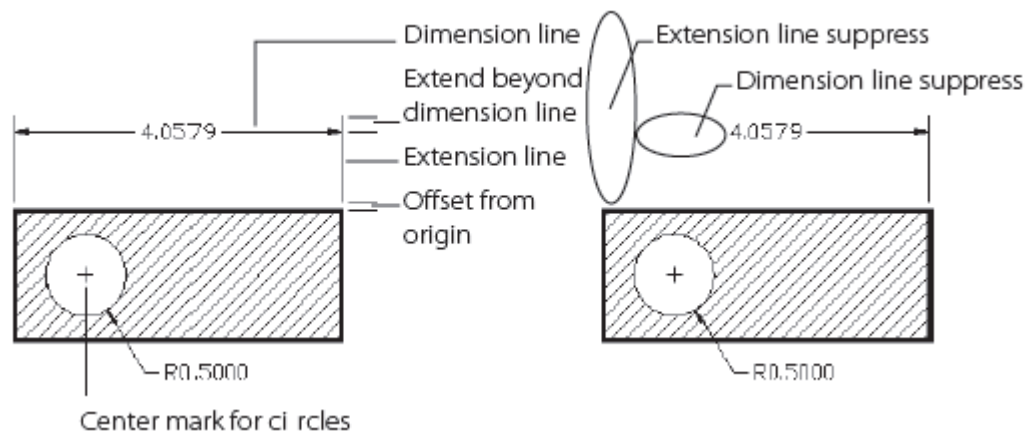
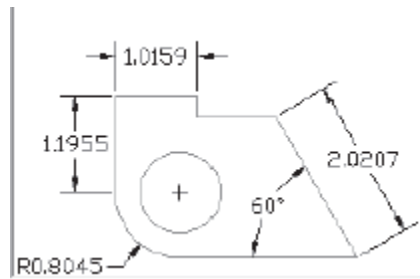


Kotiranje



Pre početka kotiranja formira se jedan ili više stilova kojima se podešavaju parametri. Njima se određuje izgled kota i način kotiranja. Potprogram se poziva sa DIM. Otvara se Dimension Style Manager. U polju Styles nalazi se spisak postojećih stilova kotiranja. Modify za izmenu pojedinih parametara postojećeg stila. Override za privremeno menjanje parametara. Compare se koristi za upoređivanje dva izabrana stila kotiranja.

U polju Dimension Line oidešavamo izgled glavne kotne linije. Extension beyond ticks zadaje prepust glavne kotne linije preko pomoćnih. Baseline Spacing određuje rastojanje između dve glavne kotne linije. Kartica Lines and Arows određuju veličinu kotnog markera i strelica. Tekst style omogućava izbor tekstualnog stila. Primar Units služe za preciznost.



Korišćena literatura:

- Introducing AutoCad 2009, George Omura, 2009
- AutoCad, Predrag Rakić, PC knjiga-Beograd, 2004

Prilog

Komande iz AutoCada 2009 uzete iz Helpa po abecednom redu

3D commands

- **3D**
Creates three-dimensional polygon mesh objects in common geometric shapes that can be hidden, shaded, or rendered
- **3DALIGN**
Aligns objects with other objects in 2D and 3D
- **3DARRAY**
Creates a 3D array
- **3DCLIP**
Starts an interactive 3D view and opens the Adjust Clipping Planes window
- **3DCONFIG**
Provides 3D graphics system configuration settings
- **3DCORBIT**
Starts an interactive 3D view and sets the objects into continuous motion
- **3DDISTANCE**
Starts the interactive 3D view and makes objects appear closer or farther away
- **3DDWF**
Creates a 3D DWF or 3D DWFx file of your three-dimensional model and displays it in the DWF Viewer
- **3DFACE**
Creates a three-sided or four-sided surface anywhere in 3D space
- **3DFLY**
Interactively changes your view of a 3D drawings so that you appear to be flying through the model
- **3DFORBIT**
Controls the interactive viewing of objects in 3D, using an unconstrained orbit
- **3DMESH**
Creates a free-form polygon mesh
- **3DMOVE**
Displays the move grip tool in a 3D view and moves objects a specified distance in a specified direction
- **3DORBIT**
Controls the interactive viewing of objects in 3D
- **3DORBITCTR**
Sets the center of rotation in 3D Orbit view

- [**3DPAN**](#)
When a drawing is in a Perspective view, starts the interactive 3D view and enables you to drag the view horizontally and vertically
- [**3DPOLY**](#)
Creates a 3D polyline
- [**3DROTATE**](#)
Displays the rotate grip tool in a 3D view and revolves objects around a base point
- [**3DSIN**](#)
Imports a 3D Studio (3DS) file
- [**3DSWIVEL**](#)
Changes the target of the view in the direction that you drag
- [**3DWALK**](#)
Interactively changes the view of a 3D drawing so that you appear to be walking through the model
- [**3DZOOM**](#)
Zooms in and out in a perspective view

A commands

- [**ABOUT**](#)
Displays information about AutoCAD
- [**ACISIN**](#)
Imports an ACIS file and creates a body object, solid, or region in the drawing
- [**ACISOUT**](#)
Exports a body object, solid, or region to an ACIS file
- [**ACTRECORD**](#)
Starts the Action Recorder
- [**ACTSTOP**](#)
Stops the Action Recorder and provides the option of saving the recorded actions to an action macro file
- [**ACTUSERINPUT**](#)
Inserts a request for user input into an action macro
- [**ACTUSERMESSAGE**](#)
Inserts a user message into an action macro
- [**ADCCLOSE**](#)
Closes DesignCenter

- [**ADCENTER**](#)
Manages and inserts content such as blocks, xrefs, and hatch patterns
- [**ADCNAVIGATE**](#)
Loads a specified DesignCenter drawing file, folder, or network path
- [**ALIGN**](#)
Aligns objects with other objects in 2D and 3D
- [**AMECONVERT**](#)
Converts AME solid models to AutoCAD solid objects
- [**ANIPATH**](#)
Saves an animation along a path in a 3D model
- [**ANNORESET**](#)
Resets the location of all [**scale representations**](#) for an [**annotative**](#) object to that of the current scale representation
- [**ANNOUPDATE**](#)
Updates existing [**annotative**](#) objects to match the current properties of their styles
- [**APERTURE**](#)
Controls the size of the object snap target box
- [**APPLOAD**](#)
Loads and unloads applications and defines which applications to load at startup
- [**ARC**](#)
Creates an arc
- [**ARCHIVE**](#)
Packages the current sheet set files to be archived
- [**AREA**](#)
Calculates the area and perimeter of objects or of defined areas
- [**ARRAY**](#)
Creates multiple copies of objects in a pattern
- [**ARX**](#)
Loads, unloads, and provides information about ObjectARX applications
- [**ATTACHURL**](#)
Attaches hyperlinks to objects or areas in a drawing
- [**ATTDEF**](#)
Creates an attribute definition for storing data in a block
- [**ATTDISP**](#)
Retains current visibility setting of each attribute
- [**ATTEDIT**](#)
Changes attribute information in a block

- [ATTEXT](#)
Extracts attribute data, informational text associated with a block, into a file
- [ATTIPEDIT](#)
Changes the textual content of an attribute within a block
- [ATTREDEF](#)
Redefines a block and updates associated attributes
- [ATTSYNC](#)
Updates block references with new and changed attributes from a specified block definition
- [AUDIT](#)
Evaluates the integrity of a drawing and corrects some errors
- [AUTOPUBLISH](#)
Publishes drawings to DWF or DWFx files automatically to the location specified

B commands

- [BACKGROUND](#)
Sets up the background for your view.
- [BACTION](#)
Adds an action to a dynamic block definition
- [BACTIONSET](#)
Specifies the selection set of objects associated with an action in a dynamic block definition
- [BACTIONTOOL](#)
Adds an action to a dynamic block definition
- [BASE](#)
Sets the insertion base point for the current drawing
- [BASSOCIATE](#)
Associates an action with a parameter in a dynamic block definition
- [BATTMAN](#)
Manages the attributes for a selected block definition
- [BATTORDER](#)
Specifies the order of attributes for a block
- [BAUTHORPALETTE](#)
Opens the Block Authoring Palettes window in the Block Editor.
- [BAUTHORPALETTECLOSE](#)
Closes the Block Authoring Palettes window in the Block Editor

- **BCLOSE**
Closes the Block Editor
- **BCYCLEORDER**
Changes the cycling order of grips for a dynamic block reference
- **BEDIT**
Opens the block definition in the Block Editor
- **BGRIPSET**
Creates, deletes, or resets grips associated with a parameter
- **BHATCH**
Fills an enclosed area or selected objects with a hatch pattern or gradient fill
- **BLIPMODE**
Controls the display of marker blips
- **BLOCK**
Creates a block definition from selected objects
- **BLOCKICON**
Generates preview images for blocks displayed in DesignCenter
- **BLOOKUPTABLE**
Displays or creates a lookup table for a dynamic block definition
- **BMPOUT**
Saves selected objects to a file in device-independent bitmap format
- **BOUNDARY**
Creates a region or a polyline from an enclosed area
- **BOX**
Creates a 3D solid box
- **BPARAMETER**
Adds a parameter with grips to a dynamic block definition
- **BREAK**
Breaks the selected object between two points
- **BREP**
Removes the history from 3D solid primitives and composite solids
- **BROWSER**
Launches the default web browser defined in your system's registry
- **BSAVE**
Saves the current block definition
- **BSAVEAS**
Saves a copy of the current block definition under a new name

- **BVHIDE**
Makes objects invisible in the current visibility state or all visibility states in a dynamic block definition
- **BVSHOW**
Makes objects visible in the current visibility state or all visibility states in a dynamic block definition
- **BVSTATE**
Creates, sets, or deletes a visibility state in a dynamic block

C commands

- **CAL**
Evaluates mathematical and geometric expressions
- **CAMERA**
Sets a camera and target location to create and save a 3D perspective view of objects
- **CHAMFER**
Bevels the edges of objects
- **CHANGE**
Changes the properties of existing objects
- **CHECKSTANDARDS**
Checks the current drawing for standards violations
- **CHPROP**
Changes the properties of an object
- **CHSPACE**
Moves objects between model space and paper space
- **CIRCLE**
Creates a circle
- **CLASSICLAYER**
Manages layer and layer properties
- **CLEANSCREENOFF**
Restores display of toolbars and dockable windows (excluding the command line)
- **CLEANSCREENON**
Clears the screen of toolbars and dockable windows (excluding the command line)
- **CLOSE**
Closes the current drawing
- **CLOSEALL**
Closes all currently open drawings

- **COLOR**
Sets the color for new objects
- **COMMANDLINE**
Displays the command line
- **COMMANDLINEHIDE**
Hides the command line
- **COMPILE**
Compiles shape files and PostScript font files into SHX files
- **CONE**
Creates a 3D solid cone
- **CONVERT**
Optimizes 2D polylines and associative hatches created in AutoCAD Release 13 or earlier
- **CONVERTCTB**
Converts a color-dependent plot style table (CTB) to a named plot style table (STB)
- **CONVERTOLDLIGHTS**
Converts lights created in previous drawing file formats to the current format
- **CONVERTOLDMATERIALS**
Converts materials created in previous drawing file formats to the current format
- **CONVERTPSTYLES**
Converts the current drawing to either named or color-dependent plot styles
- **CONVTOSOLID**
Converts polylines and circles with thickness to 3D solids
- **CONVTOSURFACE**
Converts objects to surfaces
- **COPY**
Copies objects a specified distance in a specified direction
- **COPYBASE**
Copies objects with a specified base point
- **COPYCLIP**
Copies selected objects to the Clipboard
- **COPYHIST**
Copies the text in the command prompt history to the Clipboard
- **COPYLINK**
Copies the current view to the Clipboard for linking to other OLE applications
- **COPYTOLAYER**
Copies one or more objects to another layer

- [CUI](#)
Manages customized user interface elements such as workspaces, toolbars, menus, ribbon panels, shortcut menus, and keyboard shortcuts
- [CUIEXPORT](#)
Exports customized settings to an enterprise or partial CUI file
- [CUIIMPORT](#)
Imports customized settings from an enterprise or partial CUI file to acad.cui
- [CUILOAD](#)
Loads a CUI file
- [CUIUNLOAD](#)
Unloads a CUI file
- [CUSTOMIZE](#)
Customizes tool palettes and tool palette groups
- [CUTCLIP](#)
Moves the selected objects to the Clipboard and removes them from the drawing
- [CYLINDER](#)
Creates a 3D solid cylinder

D commands

- [DATAEXTRACTION](#)
Exports object property, block attribute, and drawing information to a data extraction table or to an external file and specified a data link to an Excel spreadsheet
- [DATALINK](#)
The Data Link Manager is displayed.
- [DATALINKUPDATE](#)
Updates data to or from an established external data link.
- [DBCONNECT](#)
Provides an interface to external database tables
- [DBLIST](#)
Lists database information for each object in the drawing
- [DDEDIT](#)
Edits single-line text, dimension text, attribute definitions, and feature control frames
- [DDPTYPE](#)
Specifies the display style and size of point objects
- [DDVPOINT](#)
Sets the three-dimensional viewing direction

- **DELAY**
Provides a timed pause within a script
- **DETACHURL**
Removes hyperlinks in a drawing
- **DGNADJUST**
Changes the display options of selected DGN underlays
- **DGNATTACH**
Attaches a DGN underlay to the current drawing
- **DGNCLIP**
Defines a clipping boundary for a selected DGN underlay
- **DGNEXPORT**
Creates one or more DGN files from the current drawing
- **DGNIMPORT**
Imports the data from a DGN file into a new DWG file
- **DGNLAYERS**
Controls the display of layers in a DGN underlay
- **DGNMAPPING**
Allows users to create and edit user-defined DGN mapping setups
- **DIM and DIM1**
Accesses Dimensioning mode
- **DIMALIGNED**
Creates an aligned linear dimension
- **DIMANGULAR**
Creates an angular dimension
- **DIMARC**
Creates an arc length dimension
- **DIMBASELINE**
Creates a linear, angular, or ordinate dimension from the baseline of the previous dimension or a selected dimension
- **DIMBREAK**
Breaks or restores dimension and extension lines where they cross other objects
- **DIMCENTER**
Creates the center mark or the centerlines of circles and arcs
- **DIMCONTINUE**
Creates a linear, angular, or ordinate dimension that starts from the second extension line of the previous or selected dimension

- **DIMDIAMETER**
Creates a diameter dimension for a circle or an arc
- **DIMDISASSOCIATE**
Removes associativity from selected dimensions
- **DIMEDIT**
Edits dimension text and extension lines
- **DIMINSPECT**
Adds or removes inspection information for a selected dimension
- **DIMJOGGED**
Creates jogged dimensions for circles and arcs
- **DIMJOGLINE**
Adds or removes a jog line on a linear or aligned dimension
- **DIMLINEAR**
Creates a linear dimension
- **DIMORDINATE**
Creates ordinate dimensions
- **DIMOVERRIDE**
Overrides dimensioning system variables
- **DIMRADIUS**
Creates a radius dimension for a circle or an arc
- **DIMREASSOCIATE**
Associates selected dimensions to geometric objects
- **DIMREGEN**
Updates the locations of all associative dimensions
- **DIMSPACE**
Adjusts the spacing between linear dimensions or angular dimensions
- **DIMSTYLE**
Creates and modifies dimension styles
- **DIMTEDIT**
Moves and rotates dimension text and relocates the dimension line
- **DIST**
Measures the distance and angle between two points
- **DISTANTLIGHT**
Creates a distant light
- **DIVIDE**
Places evenly spaced point objects or blocks along the length or perimeter of an object

- **DONUT**
Creates filled circles and rings
- **DRAGMODE**
Controls the way dragged objects are displayed
- **DRAWINGRECOVERY**
Displays a list of drawing files that can be recovered after a program or system failure
- **DRAWINGRECOVERYHIDE**
Closes the Drawing Recovery Manager
- **DRAWORDER**
Changes the draw order of images and other objects
- **DSETTINGS**
Sets grid and snap, polar and object snap tracking, object snap modes, Dynamic Input, and Quick Properties
- **DSVIEWER**
Opens the Aerial View window
- **DVIEW**
Defines parallel projection or perspective views by using a camera and target
- **DWFADJUST**
Allows adjustment of a DWF or DWFx underlay at the command prompt
- **DWFATTACH**
Attaches a DWF or DWFx underlay to the current drawing
- **DWFCLIP**
Uses clipping boundaries to define a subregion of a DWF or DWFx underlay
- **DWFFORMAT**
Sets the default DWF format to either DWF or DWFx for the following commands:
- **DWFLAYERS**
Controls the display of layers in a DWF or DWFx underlay
- **DWGPROPS**
Sets and displays the properties of the current drawing
- **DXBIN**
Imports specially coded binary files

E commands

- **EATTEDIT**
Edits attributes in a block reference
- **EATTEXT**
Exports property data from objects, block attribute information, and drawing information to a table or to an external file
- **EDGE**
Changes the visibility of three-dimensional face edges
- **EDGESURF**
Creates a three-dimensional polygon mesh
- **ELEV**
Sets elevation and extrusion thickness of new objects
- **ELLIPSE**
Creates an ellipse or an elliptical arc
- **ERASE**
Removes objects from a drawing
- **ETRANSMIT**
Packages a set of files for Internet transmission
- **EXPLODE**
Breaks a compound object into its component objects
- **EXPORT**
Saves objects to other file formats
- **EXPORTLAYOUT**
Exports all visible objects from the current layout to the model space of the new drawing
- **EXPORTTOAUTOCAD**
Creates a new DWG file with all AEC objects exploded
- **EXTEND**
Extends objects to meet the edges of other objects
- **EXTERNALREFERENCES**
Displays the External References palette
- **EXTERNALREFERENCESCLOSE**
Closes the External References palette
- **EXTRUDE**
Creates a 3D solid or surface by extruding a 2D object

F commands

- **FIELD**
Creates a multiline text object with a field that can be updated automatically as the field value changes
- **FILL**
Controls the filling of objects such as hatches, two-dimensional solids, and wide polylines
- **FILLET**
Rounds and fillets the edges of objects
- **FILTER**
Creates a list of requirements that an object must meet to be included in a selection set
- **FIND**
Finds, replaces, or zooms to specified text
- **FLATSHOT**
Creates a 2D representation of all 3D objects in the current view
- **FOG**
Obsolete
- **FREESPOT**
Creates a free spotlight, which is similar to a spotlight but without a specified target
- **FREEWEB**
Creates a free weblight which is similar to a weblight but without a specified target

G commands

- **GEOGRAPHICLOCATION**
Specifies the geographic location information for a drawing file.
- **GOTOURL**
Opens the file or web page associated with the hyperlink attached to an object
- **GRADIENT**
Fills an enclosed area or selected objects with a gradient fill
- **GRAPHSCR**
Switches from the text window to the drawing area
- **GRID**
Displays a grid pattern in the current viewport
- **GROUP**
Creates and manages saved sets of objects called groups

H commands

- [HATCH](#)
Fills an enclosed area or selected objects with a hatch pattern, solid fill, or gradient fill
- [HATCHEDIT](#)
Modifies an existing hatch or fill
- [HELIX](#)
Creates a 2D spiral or 3D spring
- [HELP](#)
Displays Help
- [HIDE](#)
Regenerates a three-dimensional wireframe model with hidden lines suppressed
- [HIDEPALETTES](#)
Hides currently displayed palettes (including the command line)
- [HLSETTINGS](#)
Controls the display properties of models
- [HYPERLINK](#)
Attaches a hyperlink to an object or modifies an existing hyperlink
- [HYPERLINKOPTIONS](#)
Controls the display of the hyperlink cursor, tooltips, and shortcut menu

I commands

- [ID](#)
Displays the coordinate of a location
- [IMAGE](#)
Displays the External References palette
- [IMAGEADJUST](#)
Controls the image display of the brightness, contrast, and fade values of images
- [IMAGEATTACH](#)
Attaches a new image to the current drawing
- [IMAGECLIP](#)
Uses clipping boundaries to define a subregion of an image object
- [IMAGEFRAME](#)
Controls whether image frames are displayed and plotted
- [IMAGEQUALITY](#)
Controls the display quality of images

- [IMPORT](#)
Imports files in various formats
- [IMPRESSION](#)
Gives a CAD drawing a hand-drawn look by exporting it for rendering in Autodesk Impression.
- [IMPRINT](#)
Imprints an edge on a 3D solid
- [INSERT](#)
Inserts a block or a drawing into the current drawing
- [INSERTOBJ](#)
Inserts a linked or embedded object
- [INTERFERE](#)
Highlights 3D solids that overlap
- [INTERSECT](#)
Creates a 3D solid or 2D region from their overlapping volume or area
- [ISOPLANE](#)
Specifies the current isometric plane

J commands

- [JOGSECTION](#)
Adds a jogged segment to a section object
- [JOIN](#)
Joins similar objects to form a single, unbroken object
- [JPGOUT](#)
Saves selected objects to a file in JPEG file format
- [JUSTIFYTEXT](#)
Changes the justification point of selected text objects without changing their locations

L commands

- [LAYCUR](#)
Changes the layer of selected objects to the current layer
- [LAYDEL](#)
Deletes all objects on a layer and purges the layer
- [LAYER](#)
Manages layers and layer properties

- [LAYERCLOSE](#)
Closes Layer Properties Manager
- [LAYERP](#)
Undoes the last change or set of changes made to layer settings
- [LAYERPMODE](#)
Turns the tracking of changes made to layer settings on and off
- [LAYERSTATE](#)
Saves, restores, and manages named layer states
- [LAYFRZ](#)
Freezes the layer of selected objects
- [LAYISO](#)
Hides or locks all layers except those of the selected objects
- [LAYLCK](#)
Locks the layer of a selected object
- [LAYMCH](#)
Changes the layer of a selected object to match the destination layer
- [LAYMCUR](#)
Makes the layer of a selected object the current layer
- [LAYMRG](#)
Merges selected layers into a target layer, removing the previous layers from the drawing
- [LAYOFF](#)
Turns off the layer of a selected object
- [LAYON](#)
Turns on all layers in the drawing
- [LAYOUT](#)
Creates and modifies drawing layout tabs
- [LAYOUTWIZARD](#)
Creates a new layout tab and specifies page and plot settings
- [LAYTHW](#)
Thaws all layers in the drawing
- [LAYTRANS](#)
Changes a drawing's layers to layer standards you specify
- [LAYULK](#)
Unlocks the layer of a selected object
- [LAYUNISO](#)
Restores all layers that were hidden or locked with the LAYISO command

- [LAYVPI](#)
IFreezes selected layers in all layout viewports except the current viewport
- [LAYWALK](#)
Displays objects on selected layers and hides objects on all other layers
- [LEADER](#)
Creates a line that connects annotation to a feature
- [LENGTHEN](#)
Changes the length of objects and the included angle of arcs
- [LIGHT](#)
Creates a light
- [LIGHTLIST](#)
Displays the Lights in Model palette
- [LIGHTLISTCLOSE](#)
Closes the Lights in Model window
- [LIMITS](#)
Sets and controls the limits of the grid display in the current Model or layout tab
- [LINE](#)
Creates straight line segments
- [LINETYPE](#)
Loads, sets, and modifies linetypes
- [LIST](#)
Displays property data for selected objects
- [LIVESECTION](#)
Turns on live sectioning for a selected section object.
- [LOAD](#)
Makes shapes available for use by the SHAPE command
- [LOFT](#)
Creates a 3D solid or surface in the space between several cross sections
- [LOGFILEOFF](#)
Closes the text window log file opened by LOGFILEON
- [LOGFILEON](#)
Writes the text window contents to a file
- [LTSCALE](#)
Sets the global linetype scale factor
- [LWEIGHT](#)
Sets the current lineweight, lineweight display options, and lineweight units

M commands

- [**MARKUP**](#)
Displays the details of markups and allows you to change their status
- [**MARKUPCLOSE**](#)
Closes the Markup Set Manager
- [**MASSPROP**](#)
Calculates the mass properties of regions or 3D solids
- [**MATCHCELL**](#)
Applies the properties of a selected table cell to other table cells
- [**MATCHPROP**](#)
Applies the properties of a selected object to other objects
- [**MATERIALATTACH**](#)
Applies materials to objects by layer
- [**MATERIALMAP**](#)
Displays a material mapping gizmo to adjust the mapping on a face or an object
- [**MATERIALS**](#)
Manages, applies, and modifies materials
- [**MATERIALSCLOSE**](#)
Closes the Materials window
- [**MEASURE**](#)
Places point objects or blocks at measured intervals on an object
- [**MENU**](#)
Loads a customization file
- [**MENULOAD**](#)
Obsolete
- [**MENUUNLOAD**](#)
Obsolete
- [**MININSERT**](#)
Inserts multiple instances of a block in a rectangular array
- [**MIRROR**](#)
Creates a mirrored copy of selected objects
- [**MIRROR3D**](#)
Creates a mirrored copy of selected objects about a plane
- [**MLEADER**](#)
Creates a multileader object

- **MLEADERALIGN**
Organizes selected multileaders along a specified line
- **MLEADERCOLLECT**
Organizes selected multileaders containing blocks as content into a group attached to a single leader line
- **MLEADEREDIT**
Adds leader lines to, or removes leader lines from, a multileader object
- **MLEADERSTYLE**
Creates and modifies multileader styles
- **MLEDIT**
Edits multiline intersections, breaks, and vertices
- **MLINE**
Creates multiple parallel lines
- **MLSTYLE**
Creates, modifies, and manages multiline styles
- **MODEL**
Switches from a layout tab to the Model tab
- **MOVE**
Moves objects a specified distance in a specified direction
- **MREDO**
Reverses the effects of several previous UNDO or U commands
- **MSLIDE**
Creates a slide file of the current model viewport or the current layout
- **MSPACE**
Switches from paper space to a model space viewport
- **MTEDIT**
Edits multiline text
- **MTEXT**
Creates a multiline text object
- **MULTIPLE**
cRepeats the next command until canceled
- **MVIEW**
Creates and controls layout viewports
- **MVSETUP**
Sets up the specifications of a drawing

N commands

- **NAVSMOTION**
Displays the ShowMotion interface
- **NAVSMOTIONCLOSE**
Closes the ShowMotion interface
- **NAVSWHEEL**
Displays the SteeringWheels
- **NAVVCUBE**
Controls the visibility and display properties of the ViewCube
- **NETLOAD**
Loads a .NET application
- **NEW**
Creates a new drawing
- **NEWSHEETSET**
Creates a new sheet set
- **NEWSHOT**
Creates a named view with motion that is played back when viewed with ShowMotion.
- **NEWVIEW**
Creates a named view with no motion.

O commands

- **OBJECTSCALE**
Adds or deletes supported scales for **annotative** objects
- **OFFSET**
Creates concentric circles, parallel lines, and parallel curves
- **OLELINKS**
Updates, changes, and cancels existing OLE links
- **OLESCALE**
Controls the size, scale, and other properties of a selected OLE object
- **OOPS**
Restores erased objects

- [**OPEN**](#)
Opens an existing drawing file
- [**OPENDWFMARKUP**](#)
Opens a DWF or DWFx file that contains markups
- [**OPENSHEETSET**](#)
Opens a selected sheet set
- [**OPTIONS**](#)
Customizes the program settings
- [**ORTHO**](#)
Constrains cursor movement to the horizontal or vertical direction
- [**OSNAP**](#)
Sets running object snap modes

P commands

- [**PAGESETUP**](#)
Controls the page layout, plotting device, paper size, and other settings for each new layout
- [**PAN**](#)
Moves the view in the current viewport
- [**PARTIALLOAD**](#)
Loads additional geometry into a partially opened drawing
- [**PARTIALOPEN**](#)
Loads geometry and named objects from a selected view or layer into a drawing
- [**PASTEASHYPERLINK**](#)
Inserts data from the Clipboard as a hyperlink
- [**PASTEBLOCK**](#)
Pastes copied objects as a block
- [**PASTECLIP**](#)
Inserts data from the Clipboard
- [**PASTEORIG**](#)
Pastes a copied object in a new drawing using the coordinates from the original drawing
- [**PASTESPEC**](#)
Inserts data from the Clipboard and controls the format of the data

- **PCINWIZARD**
Displays a wizard to import PCP and PC2 configuration file plot settings into the Model tab or current layout
- **PEDIT**
Edits polylines and 3D polygon meshes
- **PFACE**
Creates a three-dimensional polyface mesh vertex by vertex
- **PLAN**
Displays the plan view of a specified user coordinate system
- **PLANESURF**
Creates a planar surface
- **PLINE**
Creates a 2D polyline
- **PLOT**
Plots a drawing to a plotter, printer, or file
- **PLOTSTAMP**
Places a plot stamp on a specified corner of each drawing and logs it to a file
- **PLOTSTYLE**
Sets the current plot style for new objects or assigns a plot style to selected objects
- **PLOTTERMANAGER**
Displays the Plotter Manager, where you can add or edit a plotter configuration
- **PNGOUT**
Saves selected objects to a file in a Portable Network Graphics format
- **POINT**
Creates a point object
- **POINTLIGHT**
Creates a point light
- **POLYGON**
Creates an equilateral closed polyline
- **POLYSOLID**
Creates a 3D wall-like polysolid
- **PRESSPULL**
Presses or pulls bounded areas
- **PREVIEW**
Shows how the drawing will look when it is plotted
- **PROPERTIES**
Controls properties of existing objects

- [PROPERTIESCLOSE](#)
Closes the Properties palette
- [PSETUPIN](#)
Imports a user-defined page setup into a new drawing layout
- [PSPACE](#)
Switches from a model space viewport to paper space
- [PUBLISH](#)
Publishes drawings to DWF or DWFx files or plotters
- [PUBLISHTOWEB](#)
Creates HTML pages that include images of selected drawings
- [PURGE](#)
Removes unused named items, such as block definitions and layers, from the drawing
- [PYRAMID](#)
Creates a 3D solid pyramid

Q commands

- [QCCLOSE](#)
Closes QuickCalc
- [QDIM](#)
Quickly creates a series of dimensions from selected objects
- [QLEADER](#)
Creates a leader and leader annotation
- [QNEW](#)
Starts a new drawing with the option of using a default drawing template file
- [QSAVE](#)
Saves the current drawing using the file format specified in the Options dialog box
- [QSELECT](#)
Creates a selection set based on filtering criteria
- [QTEXT](#)
Controls the display and plotting of text and attribute objects
- [QUICKCALC](#)
Opens the QuickCalc calculator
- [QUICKCUI](#)
Displays the Customize User Interface dialog box in a collapsed state
- [QUIT](#)
Exits the program

- [QVDRAWING](#)
Displays open drawings and layouts in a drawing in preview images
- [QVDRAWINGCLOSE](#)
Closes preview images of open drawings and layouts in a drawing
- [QVLAYOUT](#)
Displays preview images of model space and layouts in a drawing
- [QVLAYOUTCLOSE](#)
Closes preview images of model space and layouts in a drawing

R commands

- [RAY](#)
Creates a line that starts at a point and continues to infinity
- [RECOVER](#)
Repairs a damaged drawing
- [RECOVERALL](#)
Repairs a damaged drawing and xrefs
- [RECTANG](#)
Creates a rectangular polyline
- [REDEFINE](#)
Restores AutoCAD internal commands overridden by UNDEFINE
- [REDO](#)
Reverses the effects of previous UNDO or U command
- [REDRAW](#)
Refreshes the display in the current viewport
- [REDRAWALL](#)
Refreshes the display in all viewports
- [REFCLOSE](#)
Saves back or discards changes made during in-place editing of a reference (an xref or a block)
- [REFEDIT](#)
Selects an external reference or block reference for editing
- [REFSET](#)
Adds or removes objects from a working set during in-place editing of a reference (an xref or a block)
- [REGEN](#)
Regenerates the entire drawing from the current viewport

- **REGENALL**
Regenerates the drawing and refreshes all viewports
- **REGENAUTO**
Controls automatic regeneration of a drawing
- **REGION**
Converts an object that encloses an area into a region object
- **REINIT**
Reinitializes the digitizer, digitizer input/output port, and program parameters file
- **RENAME**
Changes the names of named objects
- **RENDER**
Creates a photorealistic or realistically shaded image of a three-dimensional wireframe or solid model
- **RENDERCROP**
Selects a specific region (crop window) in an image for rendering
- **RENDERENVIRONMENT**
Provides visual cues for the apparent distance of objects
- **RENDEREXPOSURE**
Provides settings to interactively adjust the global lighting for the most recent rendered output
- **RENDERPRESETS**
Specifies render presets, reusable rendering parameters, for rendering an image
- **RENDERWIN**
Displays the Render Window without invoking a render task
- **RENDSCR**
Obsolete
- **RESETBLOCK**
Resets one or more dynamic block references to the default values of the block definition
- **RESUME**
Continues an interrupted script
- **REVCLOUD**
Creates a revision cloud using a polyline
- **REVOLVE**
Creates a 3D solid or surface by sweeping a 2D object around an axis
- **REVSURF**
Creates a revolved mesh about a selected axis

- **RIBBON**
Opens the ribbon window
- **RIBBONCLOSE**
Closes the ribbon window
- **RMAT**
Obsolete
- **ROTATE**
Rotates objects around a base point
- **ROTATE3D**
Moves objects about a three-dimensional axis
- **RPREF**
Displays the Advanced Render Settings palette for access to advanced rendering settings
- **RPREFCLOSE**
Closes the Render Settings palette if it is displayed
- **RSCRIPT**
Repeats a script file
- **RULESURE**
Creates a ruled mesh between two curves

S commands

- **SAVE**
Saves the drawing under the current file name or a specified name
- **SAVEAS**
Saves a copy of the current drawing under a new file name
- **SAVEIMG**
Saves a rendered image to a file
- **SCALE**
Enlarges or reduces selected objects, keeping the proportions of the object the same after scaling
- **SCALELISTEDIT**
Controls the list of scales available for layout viewports, page layouts, and plotting
- **SCALETEXT**
Enlarges or reduces selected text objects without changing their locations
- **SCRIPT**
Executes a sequence of commands from a script file

- **SECTION**
Uses the intersection of a plane and solids to create a region
- **SECTIONPLANE**
Creates a section object that acts as a cutting plane through a 3D object
- **SECURITYOPTIONS**
Controls security settings using the Security Options dialog box
- **SELECT**
Places selected objects in the Previous selection set
- **SETBYLAYER**
Changes the property overrides of selected objects to ByLayer
- **SETIDROPHANDLER**
Specifies the default type of i-drop content for the current Autodesk application
- **SETUV**
Obsolete
- **SETVAR**
Lists or changes the values of system variables
- **SHADEMODE**
Starts the VSCURRENT command
- **SHAPE**
Inserts a shape from a shape file that has been loaded using LOAD
- **SHEETSET**
Opens the Sheet Set Manager
- **SHEETSETHIDE**
Closes the Sheet Set Manager
- **SHELL**
Accesses operating system commands
- **SHOWMAT**
Obsolete
- **SHOWPALETTES**
Restores the display of hidden palettes
- **SIGVALIDATE**
Displays information about the digital signature attached to a file
- **SKETCH**
Creates a series of freehand line segments
- **SLICE**
Slices a solid with a plane or surface

- **SNAP**
Restricts cursor movement to specified intervals
- **SOLDRAW**
Generates profiles and sections in viewports created with SOLVIEW
- **SOLID**
Creates solid-filled triangles and quadrilaterals
- **SOLIDEDIT**
Edits faces and edges of 3D solid objects
- **SOLPROF**
Creates profile images of three-dimensional solids in paper space
- **SOLVIEW**
Creates layout viewports using orthographic projection to lay out multi- and sectional view drawings of 3D solids and body objects
- **SPACETRANS**
Calculates equivalent model space and paper space lengths in a layout
- **SPELL**
Checks spelling in a drawing
- **SPHERE**
Creates a 3D solid sphere
- **SPLINE**
Creates a smooth curve that passes through or near selected points
- **SPLINEDIT**
Edits a spline or spline-fit polyline
- **SPOTLIGHT**
Creates a spotlight
- **STANDARDS**
Manages the association of standards files with drawings.
- **STATUS**
Displays drawing statistics, modes, and extents
- **STLOUT**
Stores a solid in an ASCII or binary file
- **STRETCH**
Stretches objects crossed by a selection window or polygon
- **STYLE**
Creates, modifies, or specifies text styles
- **STYLESMANAGER**
Displays the Plot Style Manager

- **SUBTRACT**
Combines selected 3D solids or 2D regions by subtraction
- **SUNPROPERTIES**
Opens the Sun Properties window and sets the properties of the sun
- **SUNPROPERTIESCLOSE**
Closes the Sun Properties window
- **SWEEP**
Creates a 3D solid or surface by sweeping a 2D object along a path
- **SYSWINDOWS**
Arranges windows and icons when the application window is shared with external applications

T commands

- **TABLE**
Creates an empty table object
- **TABLEDIT**
Edits text in a table cell
- **TABLEEXPORT**
Exports data from a table object in CSV file format
- **TABLESTYLE**
Creates, modifies, or specifies table styles
- **TABLET**
Calibrates, configures, and turns on and off an attached digitizing tablet
- **TABSURF**
Creates a tabulated mesh from a path curve and a direction vector
- **TARGETPOINT**
Creates a target point light
- **TASKBAR**
Controls how drawings are displayed on the Windows taskbar
- **TEXT**
Creates a single-line text object
- **TEXTSCR**
Opens the text window
- **TEXTTOFRONT**
Brings text and dimensions in front of all other objects in the drawing

- [**THICKEN**](#)
Creates a 3D solid by thickening a surface
- [**TIFOUT**](#)
Saves selected objects to a file in TIFF file format
- [**TIME**](#)
Displays the date and time statistics of a drawing
- [**TINSERT**](#)
Inserts a block in a table cell
- [**TOLERANCE**](#)
Creates geometric tolerances contained in a feature control frame
- [**TOOLBAR**](#)
Displays, hides, and customizes toolbars
- [**TOOLPALETTES**](#)
Opens the Tool Palettes window
- [**TOOLPALETTECLOSE**](#)
Closes the Tool Palettes window
- [**TORUS**](#)
Creates a donut-shaped 3D solid
- [**TPNAVIGATE**](#)
Displays a specified tool palette or palette group
- [**TRACE**](#)
Creates solid lines
- [**TRANSPARENCY**](#)
Controls whether background pixels in a bitonal image are transparent or opaque
- [**TRAYSETTINGS**](#)
Controls the display of icons and notifications in the status bar tray
- [**TREESTAT**](#)
Displays information about the drawing's current spatial index
- [**TRIM**](#)
Trims objects to meet the edges of other objects

U commands

- [**U**](#)
Reverses the most recent operation
- [**UCS**](#)
Manages user coordinate systems

- [UCSICON](#)
Controls the visibility and placement of the UCS icon
- [UCSMAN](#)
Manages defined user coordinate systems
- [UNDEFINE](#)
Allows an application-defined command to override an internal command
- [UNDO](#)
Reverses the effect of commands
- [UNION](#)
Combines selected 3D solids or 2D regions by addition
- [UNITS](#)
Controls coordinate and angle display formats and precision
- [UPDATEFIELD](#)
Manually updates fields in selected objects in the drawing
- [UPDATETHUMBSNOW](#)
Manually updates thumbnail previews for sheets, sheet views, and model space views in the Sheet Set Manager; and thumbnail previews for drawings and layouts in Quick View.

V commands

- [VBAIDE](#)
Displays the Visual Basic Editor
- [VBALOAD](#)
Loads a global VBA project into the current work session
- [VBAMAN](#)
Loads, unloads, saves, creates, embeds, and extracts VBA projects
- [VBARUN](#)
Runs a VBA macro
- [VBASTMT](#)
Executes a VBA statement at the AutoCAD command prompt
- [VBAUNLOAD](#)
Unloads a global VBA project
- [VIEW](#)
Saves and restores named views, camera views, layout views, and preset views
- [VIEWGO](#)
Restores a named view

- [VIEWPLAY](#)
Plays the animation associated to a named view
- [VIEWPLOTDETAILS](#)
Displays information about completed plot and publish jobs
- [VIEWRES](#)
Sets the resolution for objects in the current viewport
- [VISUALSTYLES](#)
Creates and modifies visual styles and applies a visual style to a viewport
- [VISUALSTYLESCLOSE](#)
Closes the Visual Styles Manager
- [VLISP](#)
Displays the Visual LISP interactive development environment (IDE)
- [VPCLIP](#)
Clips viewport objects and reshapes the viewport border
- [VPLAYER](#)
Sets layer visibility within viewports
- [VPMAX](#)
Expands the current layout viewport for editing
- [VPMIN](#)
Restores the current layout viewport
- [VPOINT](#)
Sets the viewing direction for a three-dimensional visualization of the drawing
- [VPORTS](#)
Creates multiple viewports in model space or paper space
- [VSCURRENT](#)
Sets the visual style in the current viewport
- [VSLIDE](#)
Displays an image slide file in the current viewport
- [VSSAVE](#)
Saves a visual style
- [VTOPTIONS](#)
Displays a change in view as a smooth transition

W commands

- [WALKFLYSETTINGS](#)
Specifies walk and fly settings
- [WBLOCK](#)
Writes objects or a block to a new drawing file
- [WEBLIGHT](#)
Creates a web light
- [WEDGE](#)
Creates a 3D solid wedge
- [WHOHAS](#)
Displays ownership information for opened drawing files
- [WIPEOUT](#)
Creates wipeout objects
- [WMFIN](#)
Imports a Windows metafile
- [WMFOPTS](#)
Sets options for WMFIN
- [WMFOUT](#)
Saves objects to a Windows metafile
- [WORKSPACE](#)
Creates, modifies, and saves workspaces and makes a workspace current
- [WSSAVE](#)
Saves a workspace
- [WSSETTINGS](#)
Sets options for workspaces

X commands

- [XATTACH](#)
Attaches an external reference to the current drawing
- [XBIND](#)
Binds one or more definitions of named objects in an xref to the current drawing
- [XCLIP](#)
Defines an xref or block clipping boundary and sets the front and back clipping planes

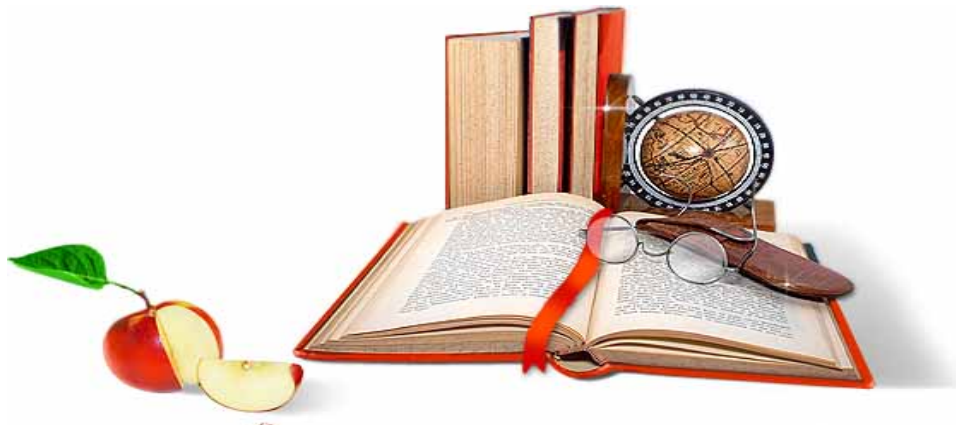
- [**XEDGES**](#)
Creates wireframe geometry by extracting edges from a 3D solid or surface
- [**XLINE**](#)
Creates a line of infinite length
- [**XOPEN**](#)
Opens a selected drawing reference (xref) in a new window
- [**XPLODE**](#)
Breaks a compound object into its component objects
- [**XREF**](#)
Starts the EXTERNALREFERENCES command

Z commands

- [**ZOOM**](#)
Increases or decreases the apparent size of objects in the current viewport

BESPLATNI GOTOVI SEMINARSKI, DIPLOMSKI I MATURSKI RAD.

RADOVI IZ SVIH OBLASTI, POWERPOINT PREZENTACIJE I DRUGI EDUKATIVNI
MATERIJALI.



WWW.SEMINARSKIRAD.ORG

WWW.MATURSKIRADOVI.NET

WWW.MATURSKI.NET

WWW.SEMINARSKIRAD.INFO

WWW.MATURSKI.ORG

WWW.ESSAYSX.COM

WWW.FACEBOOK.COM/DIPLOMSKIRADOVI

NA NAŠIM SAJTOVIMA MOŽETE PRONAĆI SVE, BILO DA JE TO **[SEMINARSKI](#)**, **[DIPLOMSKI](#)** ILI **[MATURSKI](#)** RAD, POWERPOINT PREZENTACIJA I DRUGI EDUKATIVNI MATERIJAL. ZA RAZLIKU OD OSTALIH MI VAM PRUŽAMO DA POGLEDATE SVAKI RAD, NJEGOV SADRŽAJ I PRVE TRI STRANE TAKO DA MOŽETE TAČNO DA ODABERETE ONO ŠTO VAM U POTPUNOSTI ODGOVARA. U BAZI SE NALAZE **[GOTOVI SEMINARSKI, DIPLOMSKI I MATURSKI RADOVI](#)** KOJE MOŽETE SKINUTI I UZ NJIHOVU POMOĆ NAPRAVITI JEDINSTVEN I UNIKATAN RAD. AKO U **[BAZI](#)** NE NAĐETE RAD KOJI VAM JE POTREBAN, U SVAKOM MOMENTU MOŽETE NARUČITI DA VAM SE IZRADI NOVI, UNIKATAN SEMINARSKI ILI NEKI DRUGI RAD NA LINKU **[IZRADA RADOVA](#)**. PITANJA I ODGOVORE MOŽETE DOBITI NA NAŠEM **[FORUMU](#)** ILI NA **MATURSKIRADOVI.NET@GMAIL.COM**