

A+CAD Quick Start Guide

Using the Power of A+CAD

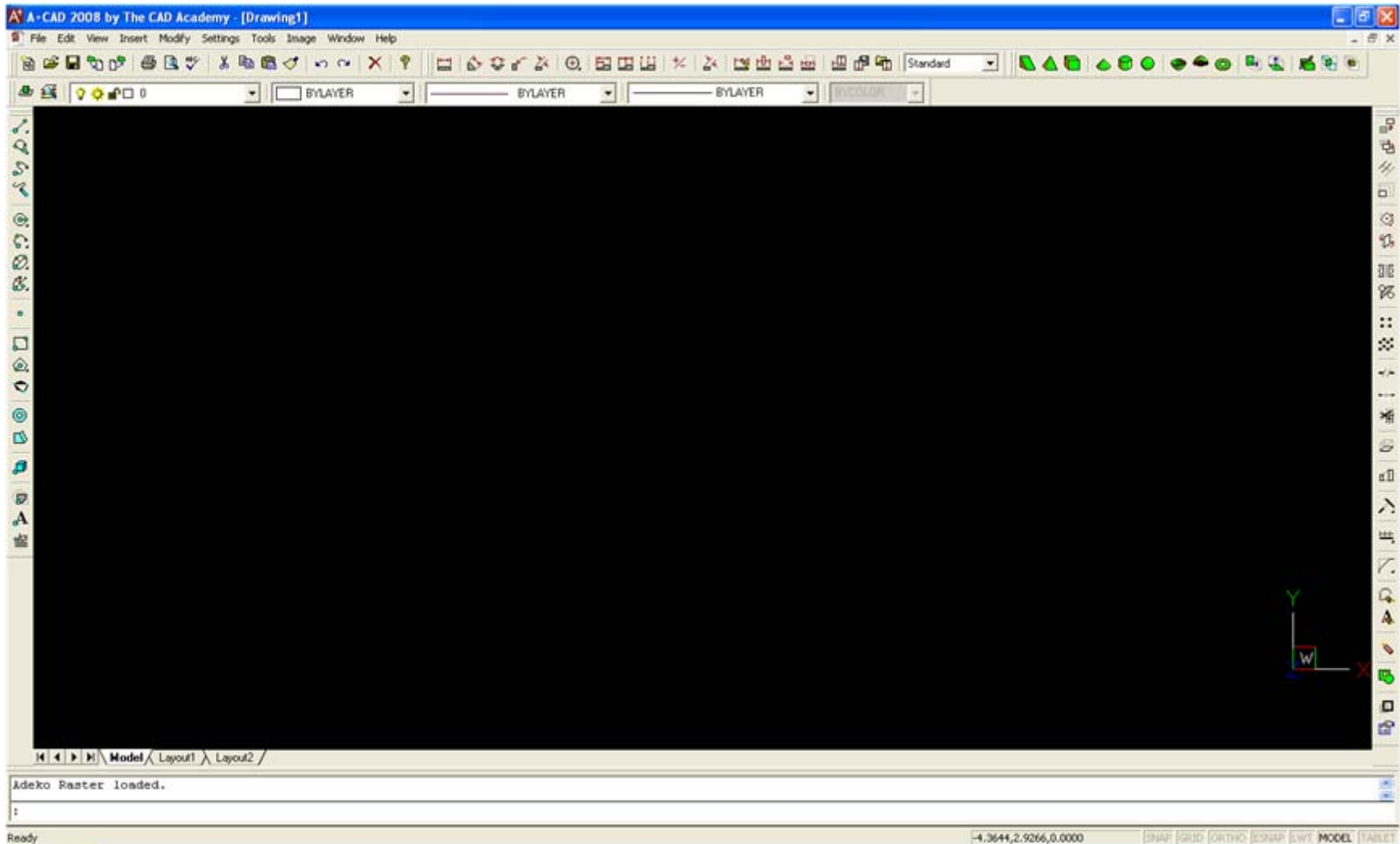
JANUARY 2008



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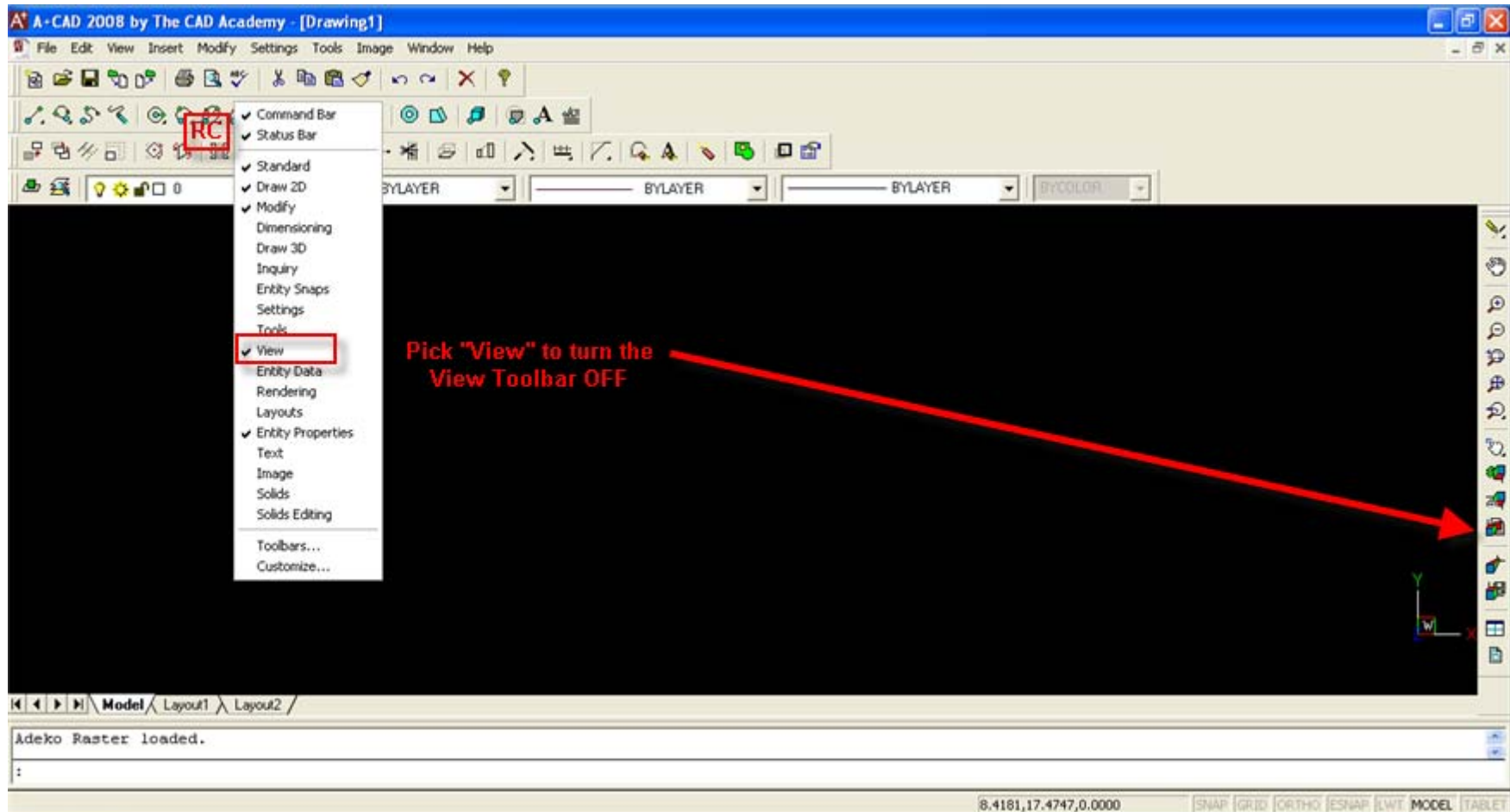
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Lesson 1: Customizing the interface



In this lesson you will learn to create a gear, turn ON / OFF, MOVE, and DOCK toolbars, and customize your A+CAD 2008 screen to look like the illustration above.

Lesson 1: Customizing the interface



Turn OFF the View Toolbar:

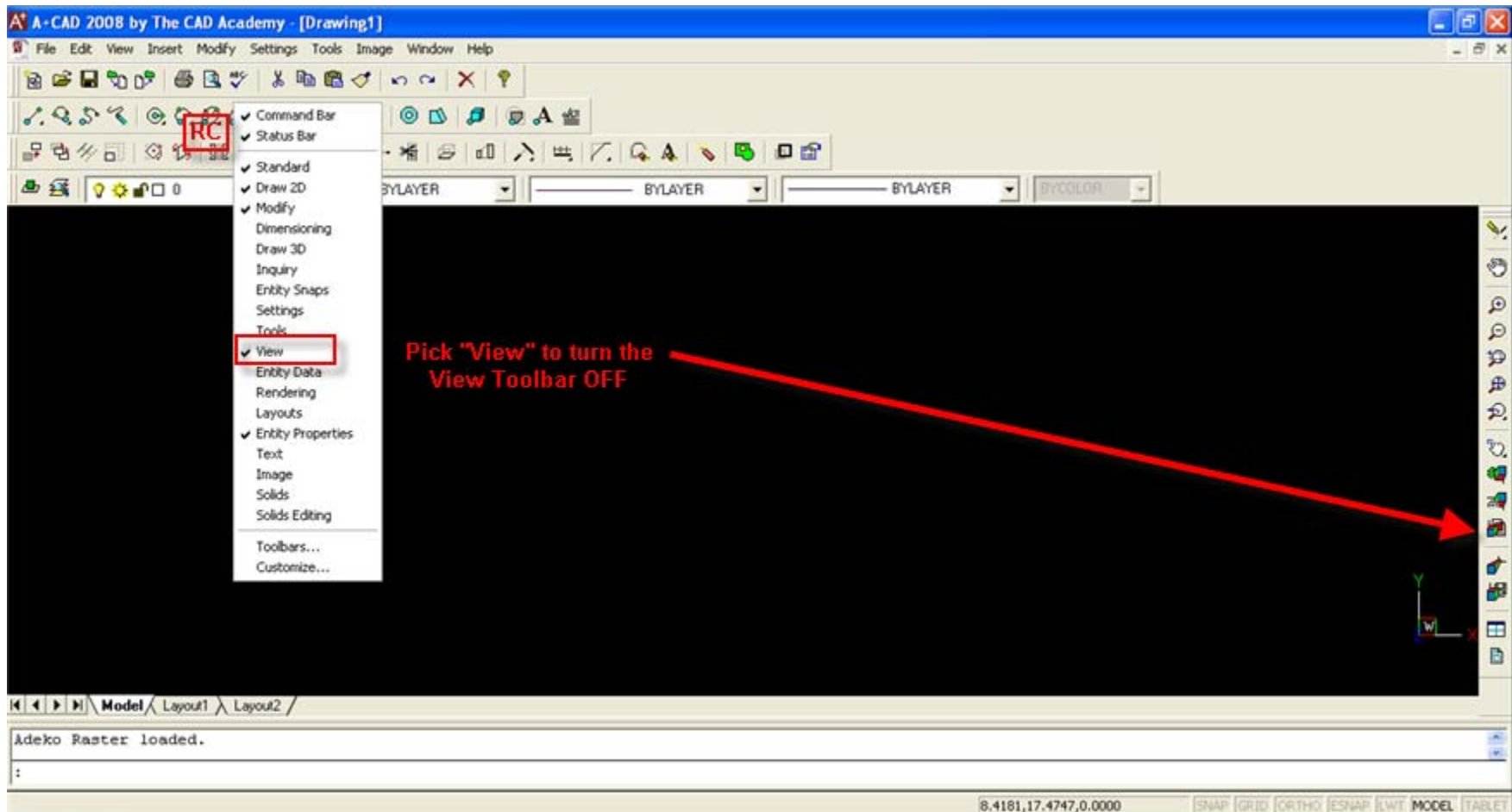
Right Click (RC) on any toolbar button to display the menu.

Pick on VIEW in the menu to turn it OFF.

The "check" next to VIEW should now be removed

The Toolbar should NOT be visible now.

Lesson 1: Customizing the interface



Turn ON the Dimensioning Toolbar:

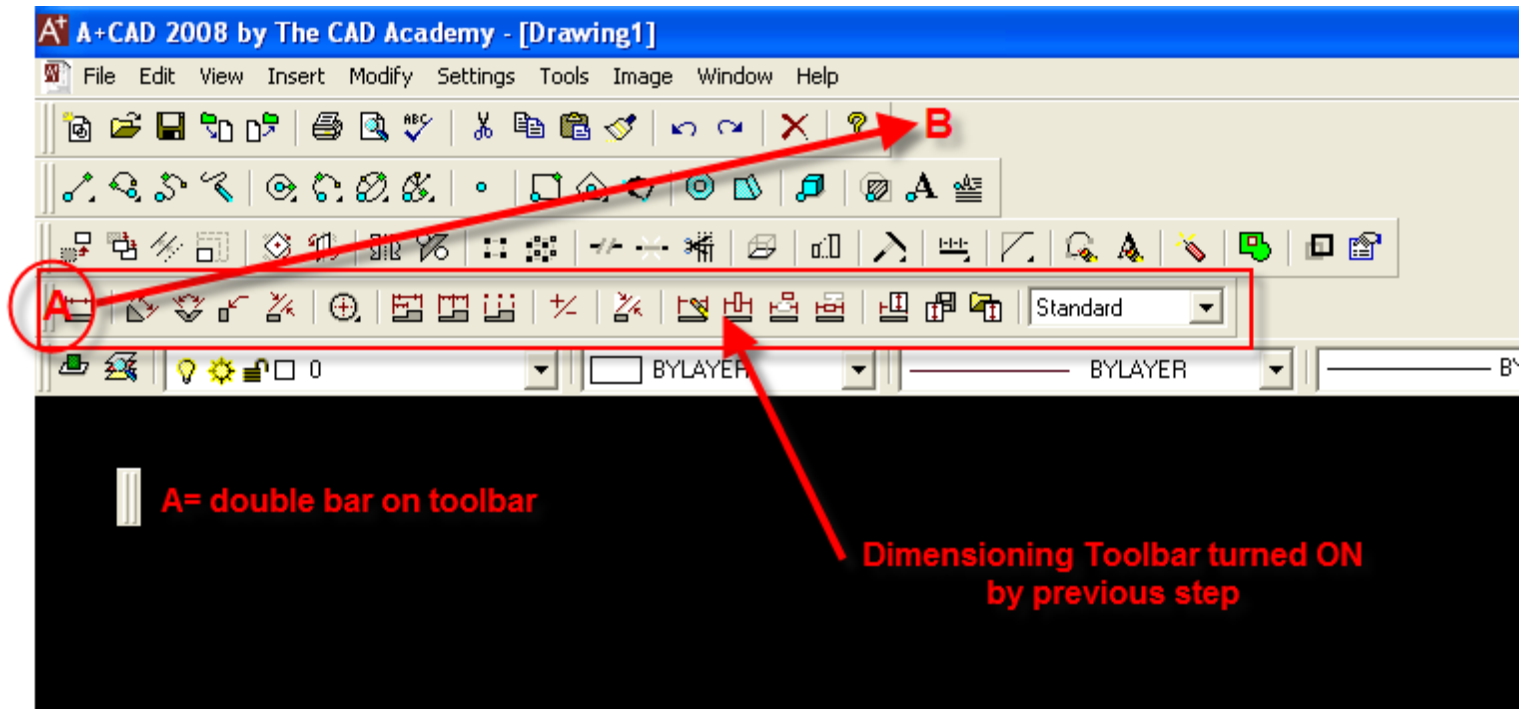
Right Click (RC) on any toolbar button to display the menu.

Pick on DIMENSIONING in the menu to turn it ON.


There should now be a "check" next to DIMENSIONING in the menu.

The DIMENSIONING Toolbar is now visible.

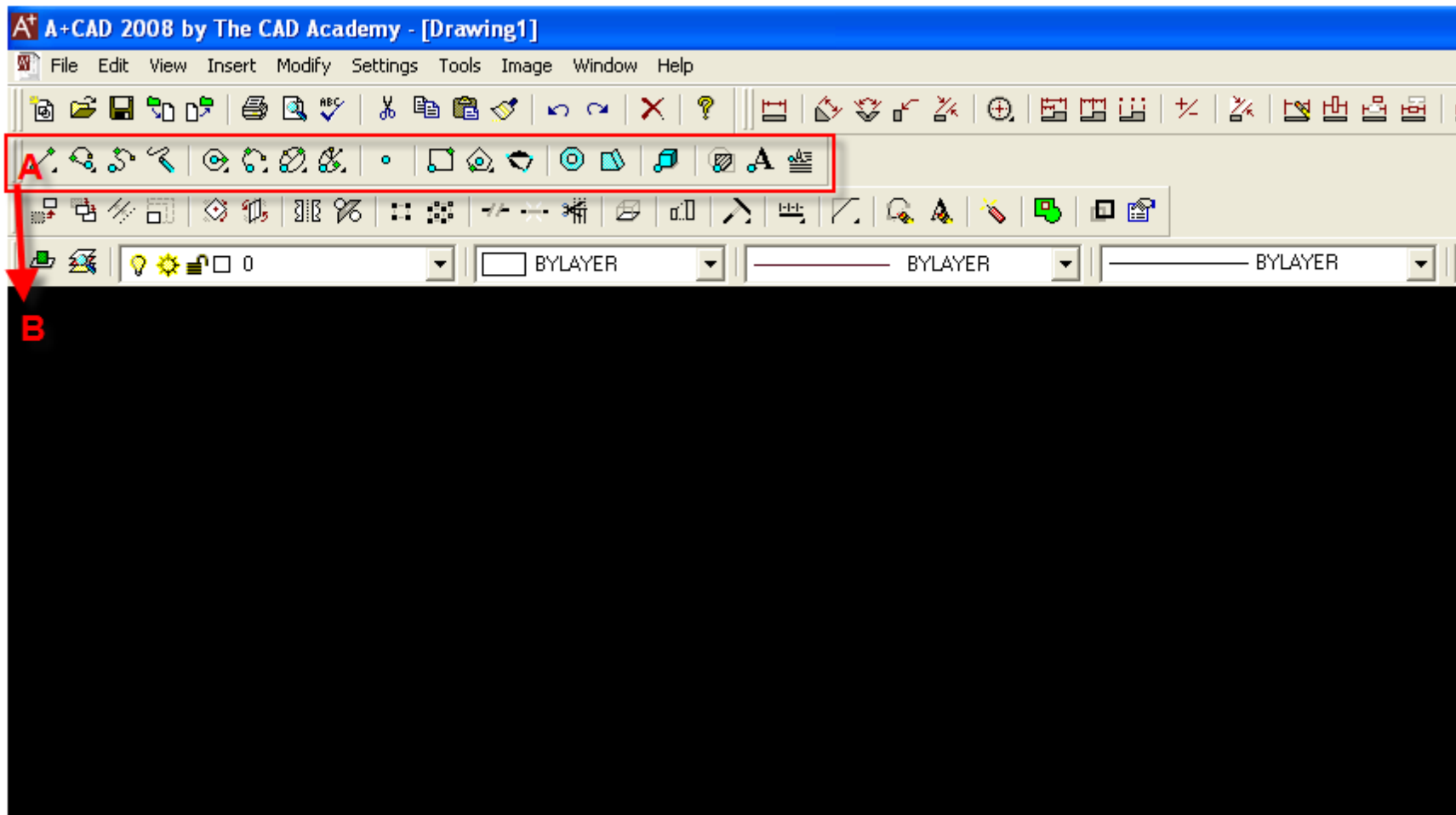
Lesson 1: Customizing the interface



Move the Dimensioning Toolbar:

Pick and Hold on the double bar  on the end of the DIMENSIONING Toolbar.
While continuing to pick, DRAG the toolbar from A to B.
The Dimensioning Toolbar should now be "docked" to the right of the Standard toolbar.

Lesson 1: Customizing the interface



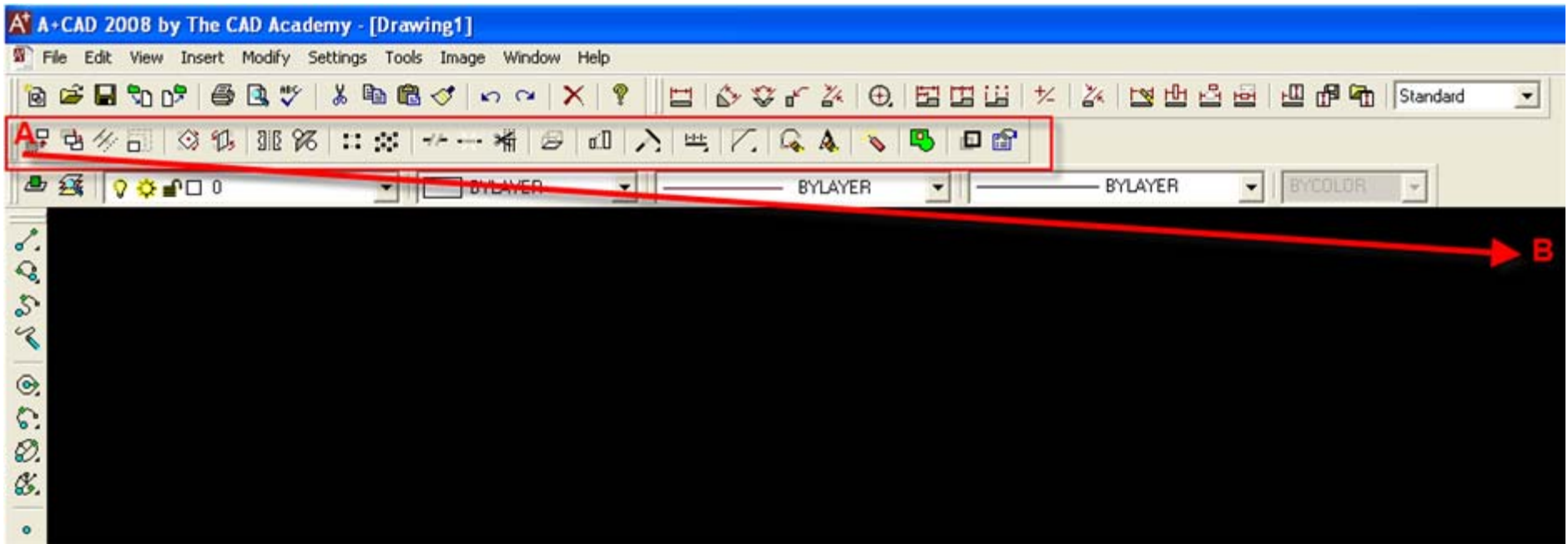
Move the Draw 2D Toolbar:

Pick and Hold on the double bar  on the end of the DRAW 2D Toolbar.
While continuing to pick, DRAG the toolbar from A to B.

When you are near point B, the dragging toolbar should change from a horizontal box to a vertical box. When it changes to a vertical box it is ready to DOCK to the edge of the A+CAD window.

The DRAW 2D Toolbar should now be “docked” to the left of the A+CAD window.

Lesson 1: Customizing the interface



Move the MODIFY Toolbar:

Pick and Hold on the double bar  on the end of the MODIFY Toolbar.
While continuing to pick, DRAG the toolbar from A to B.

When you are near point B, the dragging toolbar should change from a horizontal box to a vertical box. When it changes to a vertical box it is ready to DOCK to the edge of the A+CAD window.

The MODIFY Toolbar should now be “docked” to the right of the A+CAD window.

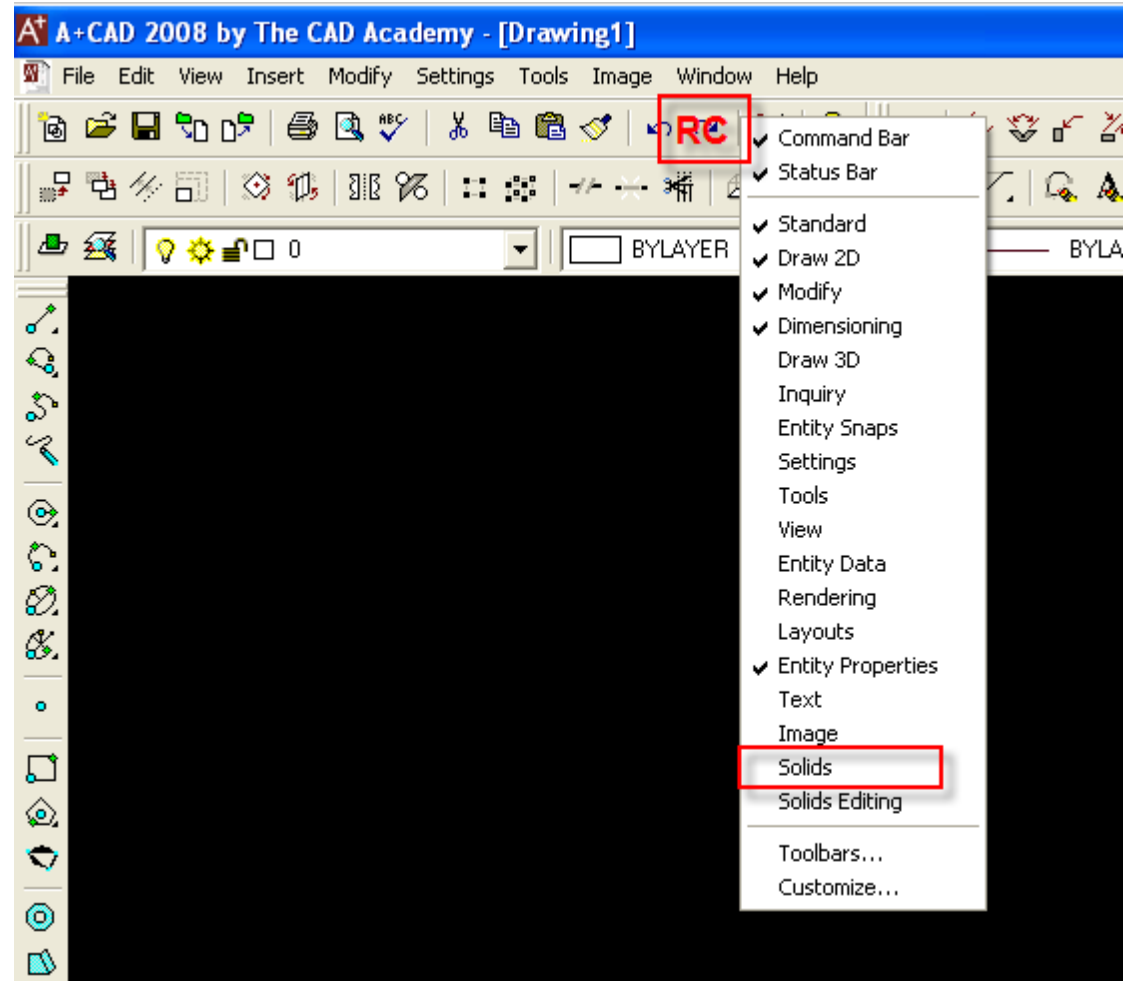
Lesson 1: Customizing the interface

Turn ON the SOLIDS Toolbar:

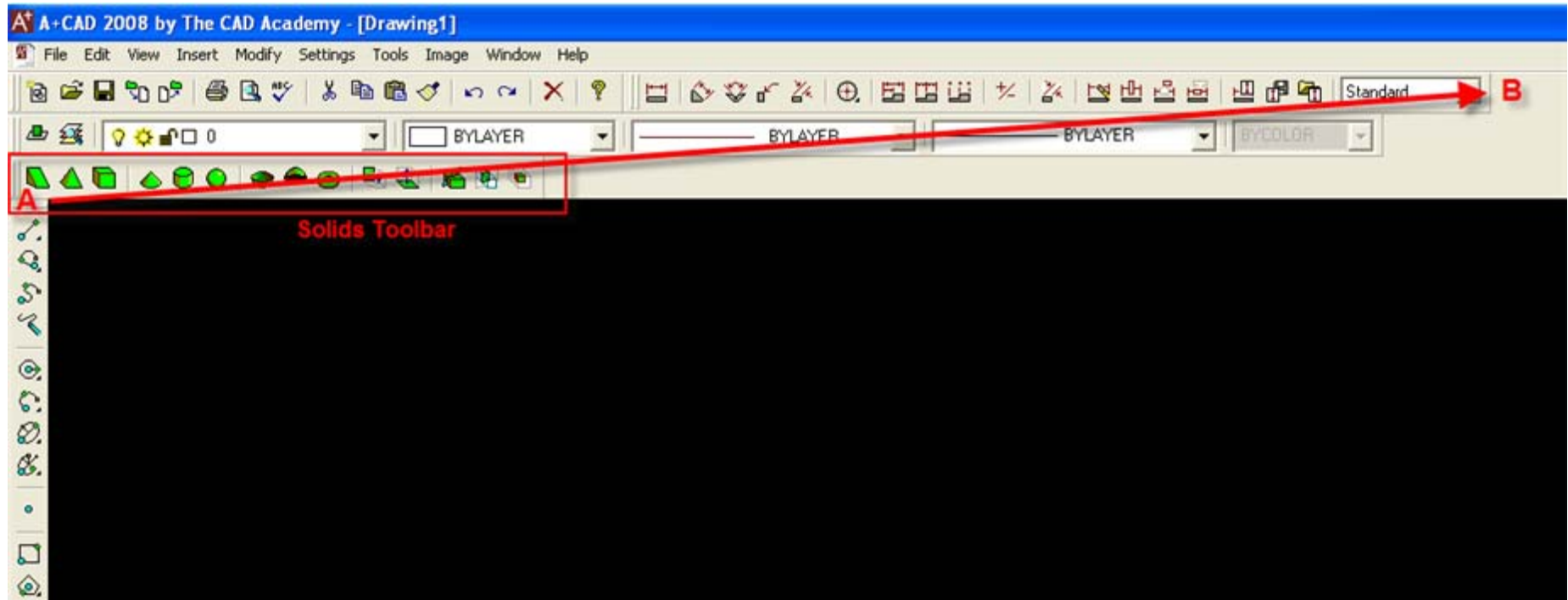
Right Click (RC) on any toolbar button to display the menu.

Pick on SOLIDS in the menu

This should turn the SOLIDS Toolbar ON and place it in its last know position.



Lesson 1: Customizing the interface



Move the SOLIDS Toolbar:

Pick and Hold on the double bar  on the end of the SOLIDS Toolbar.

While continuing to pick, DRAG the toolbar from A to B.

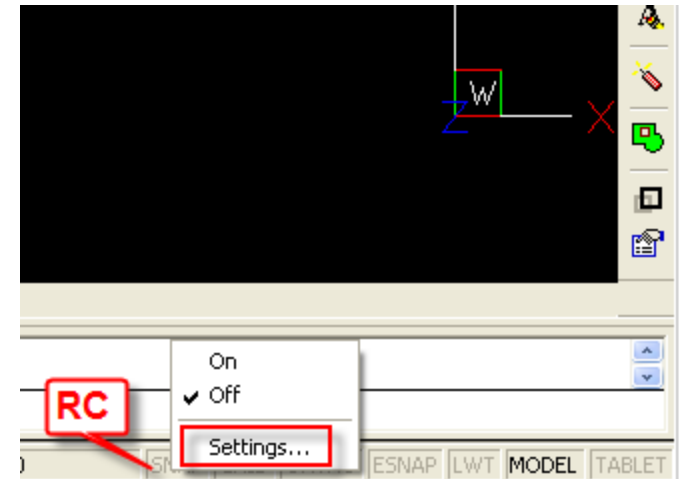
The SOLIDS Toolbar should now be “docked” to the right of the DIMENSIONING Toolbar.

This completes Lesson 1!

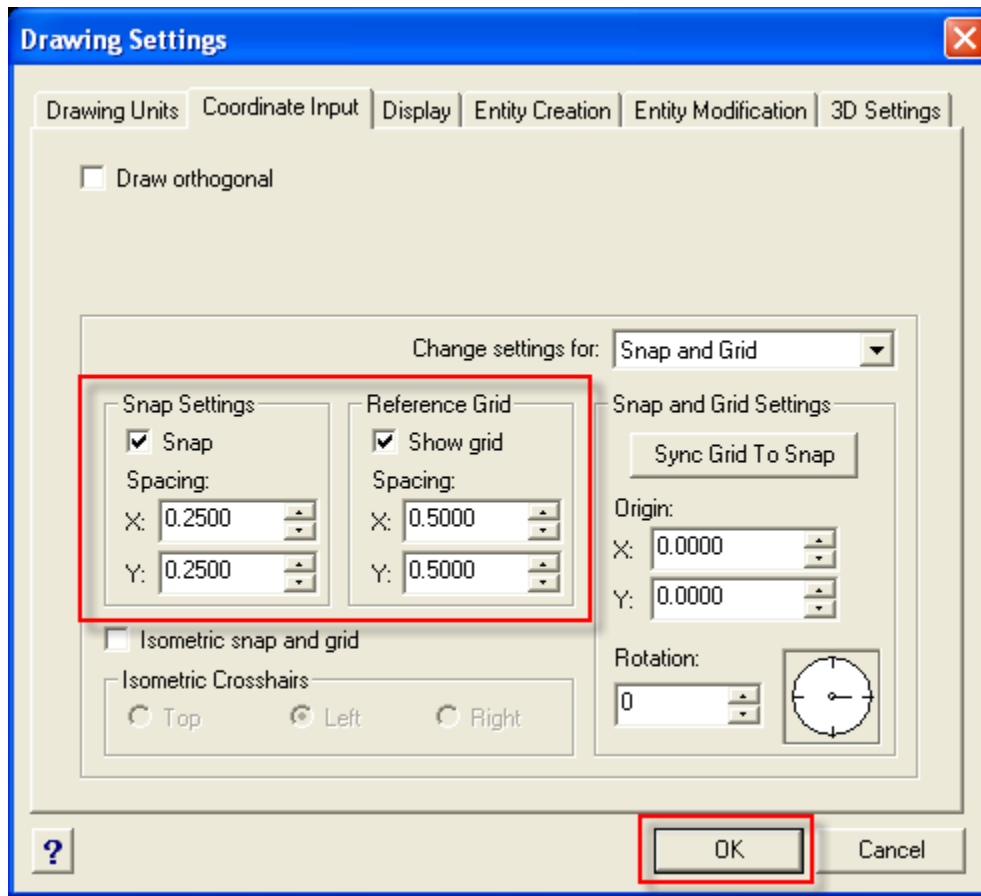
Lesson 2: Setup Drawing

Change the SNAP and GRID Settings:

We are going to start a mechanical drawing and by default A+CAD starts up with an "A" size sheet (8-1/2 x 11") with decimal units. Precision drafting often start a drawing by placing a grid on the screen and a snap increment. RIGHT CLICK on SNAP located at the bottom of the screen and select SETTINGS as shown. See illustration on right.



You will see the following dialog. See illustration on left. Make sure SNAP and GRID are checked ON and that the GRID is .5 and the SNAP is .25. Pick OK to close the dialog.



Lesson 2: Setup Drawing

Change the view:

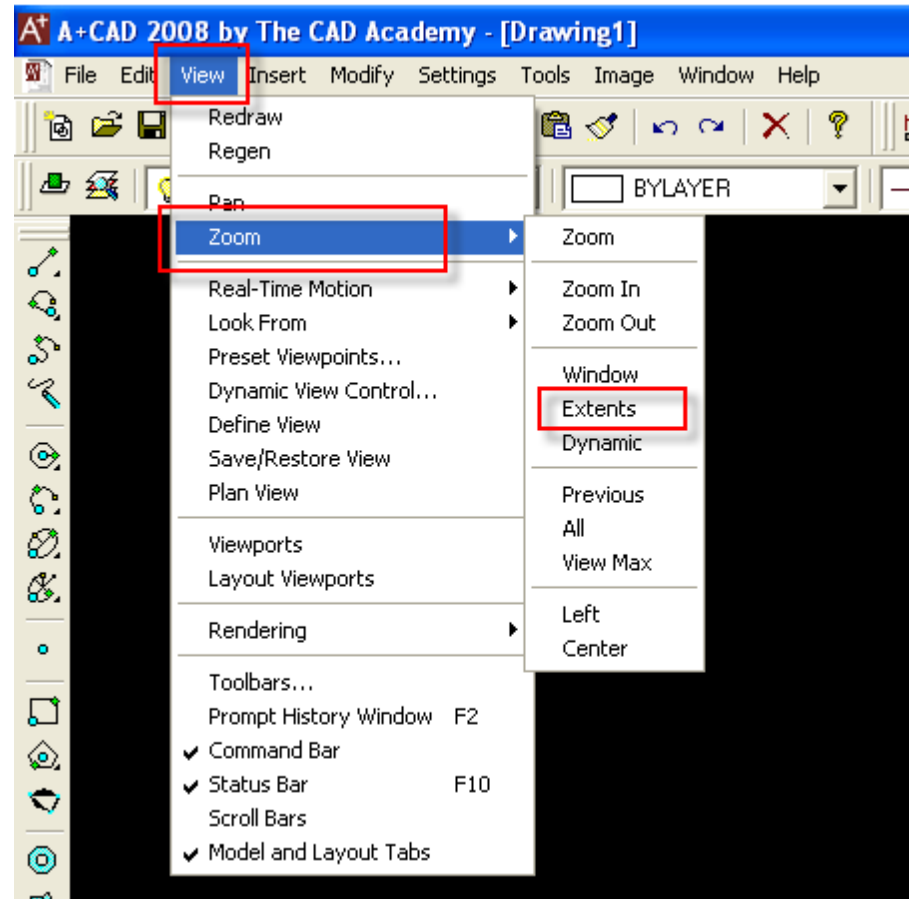
“Zoom in” on the GRID using the ZOOM command.

Click on the VIEW Pulldown menu. Click on Zoom and click on EXTENTS from the Flyout menu.

Note: You can also use the Zoom Extents button from the VIEW Toolbar. You must first turn this toolbar on using the features learned in Lesson 1.



Now we are ready to start our drawing.



This completes Lesson 2!

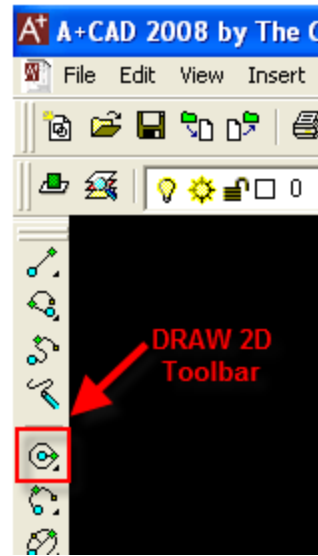
Lesson 3: Create a 3D Gear

Draw 2D Objects:

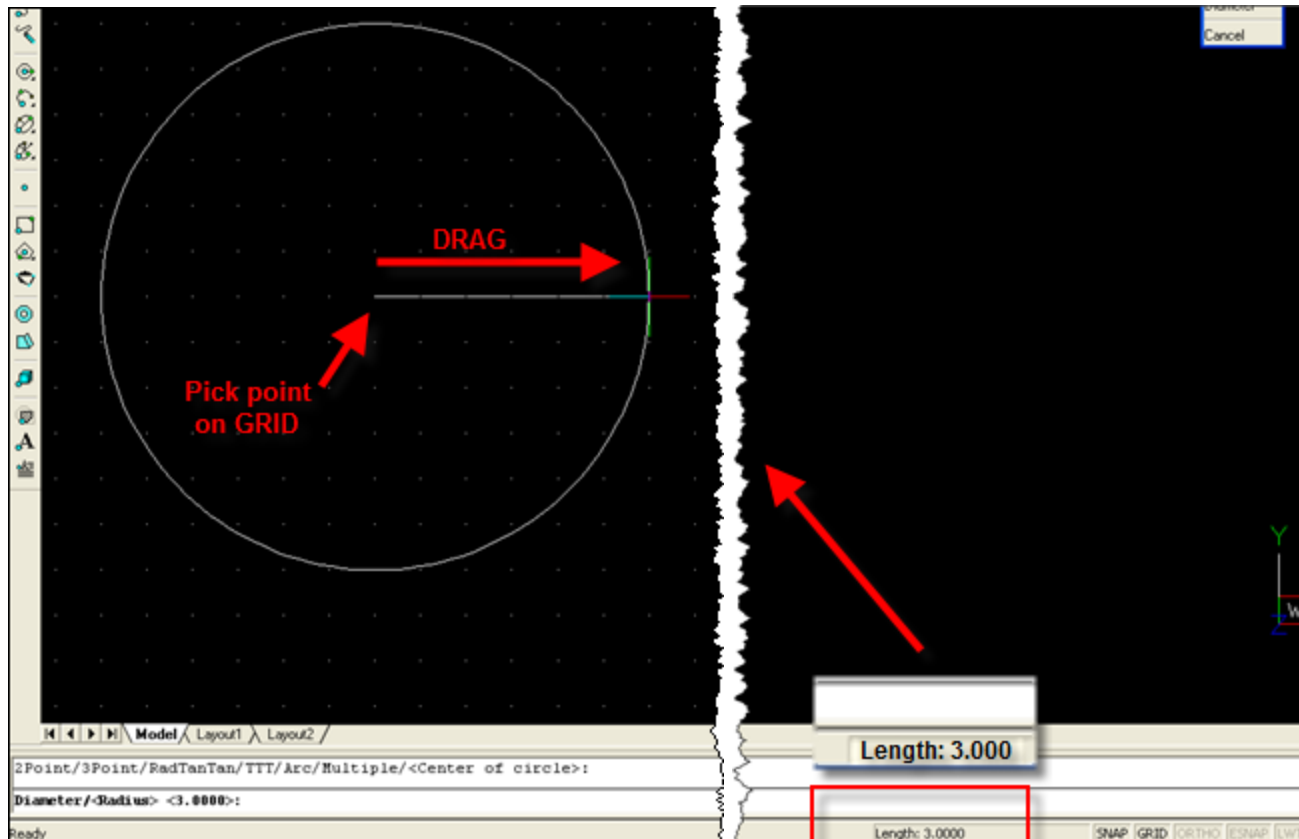
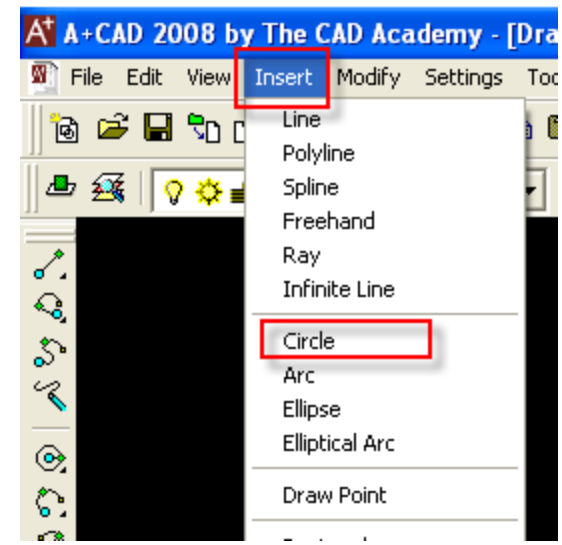
The CIRCLE command:

Select CIRCLE from the DRAW 2D Toolbar on the LEFT-HAND SIDE of the screen.

Note: You can also select CIRCLE from the INSERT Pulldown Menu.




OR



We are going to place a CIRCLE approximately in the center of our page as shown by picking a beginning point. Make sure the value is **3.000**

HINT: Use the "LENGTH" value in the STATUS BAR at the bottom of the A+CAD window to size the circle.

 Always look at the COMMAND LINE when using the A+CAD commands. This is where the command will prompt for further information.

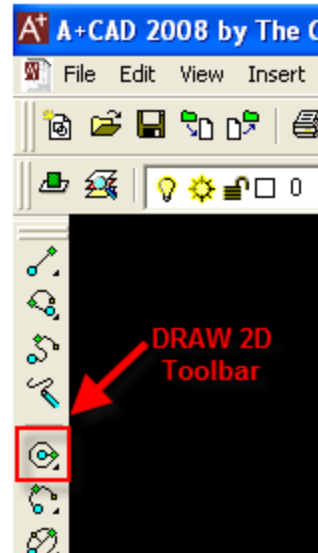
Lesson 3: Create a 3D Gear

Draw 2D Objects continued:

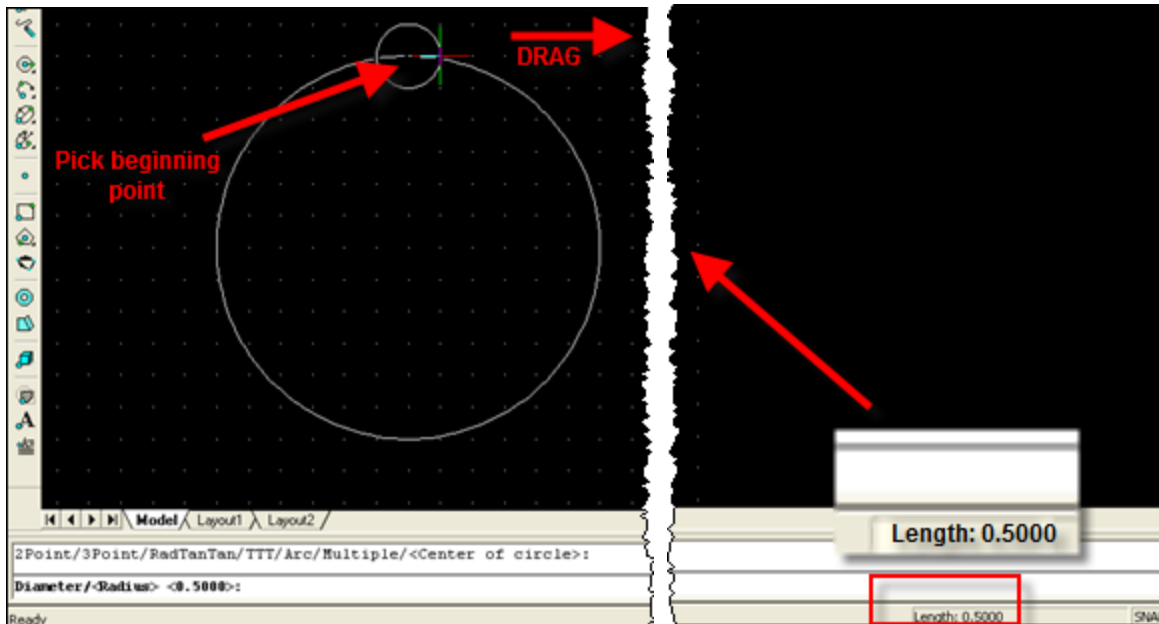
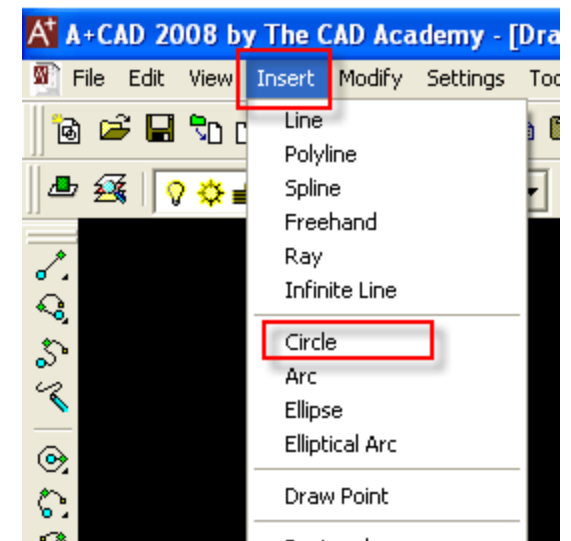
The CIRCLE command:

Select CIRCLE from the DRAW 2D Toolbar on the LEFT-HAND SIDE of the screen.

Note: You can also select CIRCLE from the INSERT Pulldown Menu.



OR



We are going to place a CIRCLE at the top quadrant point of the first circle as shown by picking the beginning point. Make sure the value is **0.5000**

HINT: Use the "LENGTH" value in the STATUS BAR at the bottom of the A+CAD window to size the circle.

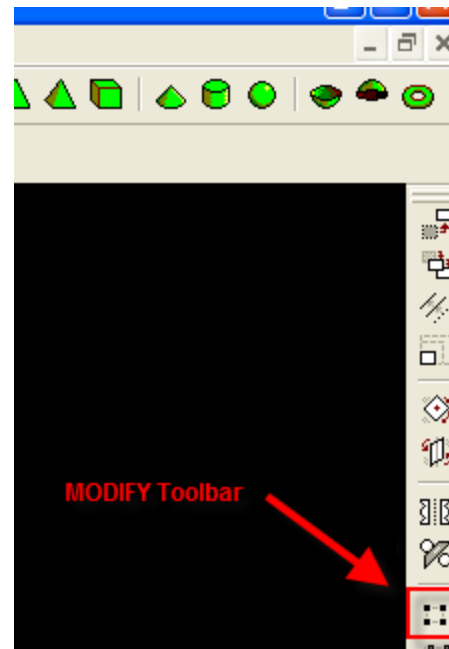
Lesson 3: Create a 3D Gear

Draw 2D Objects continued:

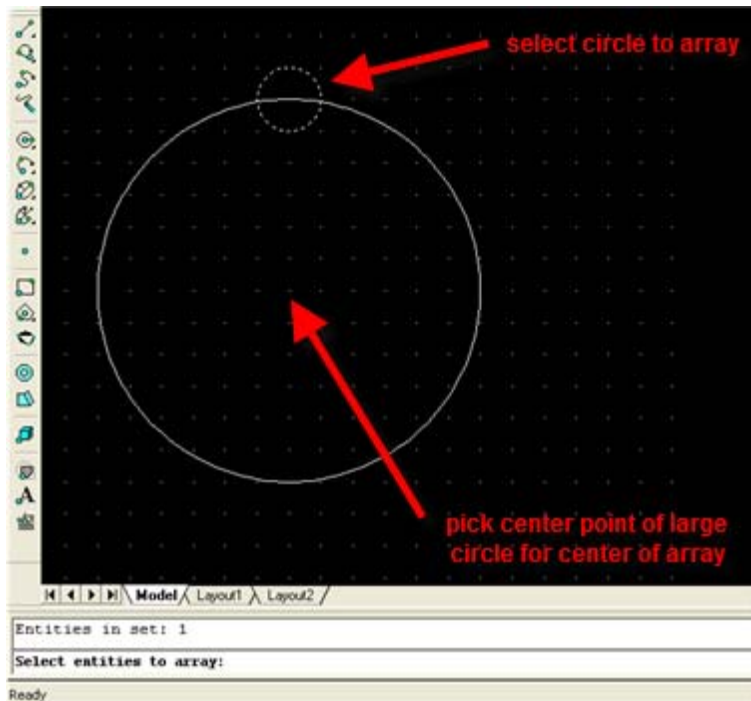
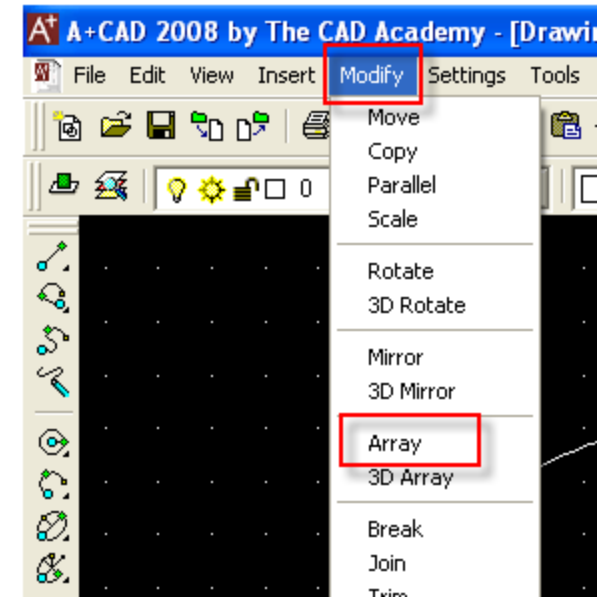
The ARRAY command:

We are now going to ARRAY the CIRCLE. Select the ARRAY tool from the MODIFY menu as shown:

Note: You can also select ARRAY from the MODIFY Pulldown Menu.



OR



💡 Look at the COMMAND LINE when using the A+CAD commands. This is where the command will prompt for further information.

Select circle to array and press ENTER.

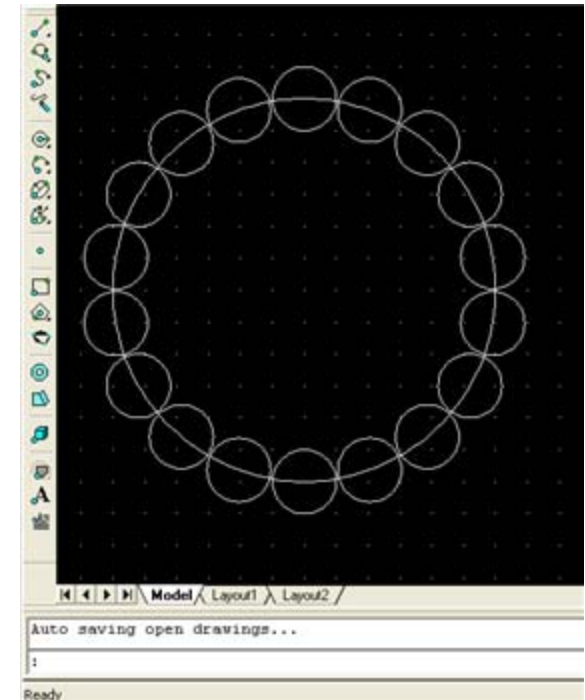
Next type in P for POLAR (circular array) and press ENTER.

Select the CENTER of the CIRCLE for the center of the array.

Type in 18 for the number of items and press ENTER and press ENTER again for 360 or a complete circle.

Press enter to select YES to ROTATE entities around the array.

Your drawing should end up as shown in illustration on right.



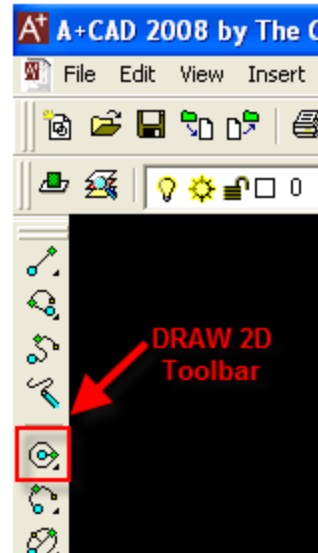
Lesson 3: Create a 3D Gear

Draw 2D Objects continued:

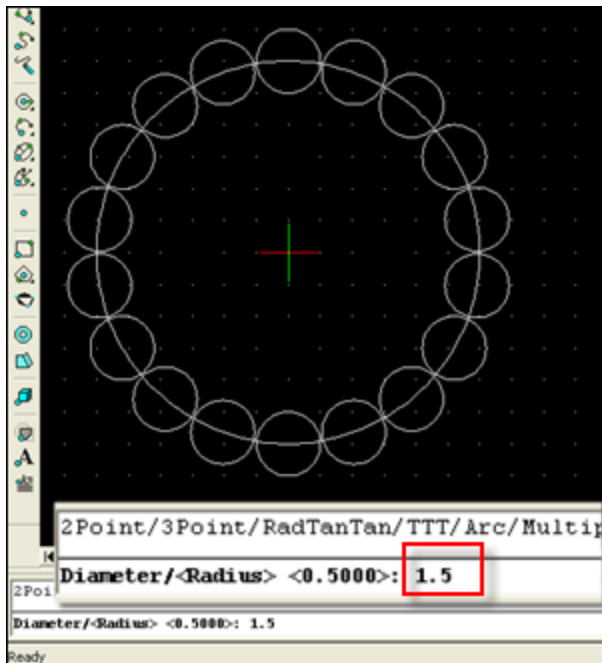
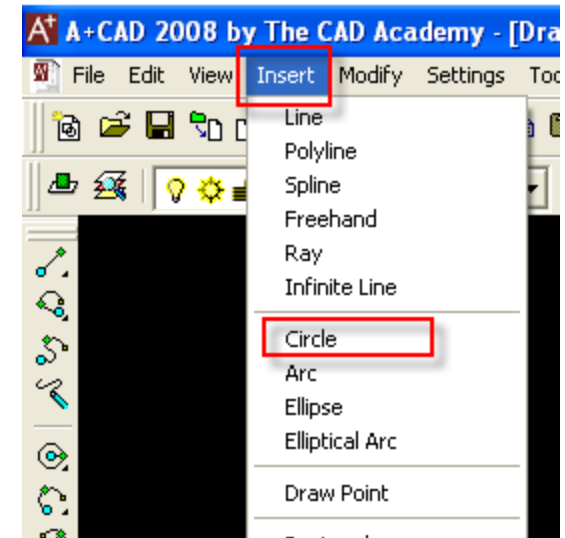
The CIRCLE command:

Select CIRCLE from the DRAW 2D Toolbar on the LEFT-HAND SIDE of the screen.

Note: You can also select CIRCLE from the INSERT Pulldown Menu.

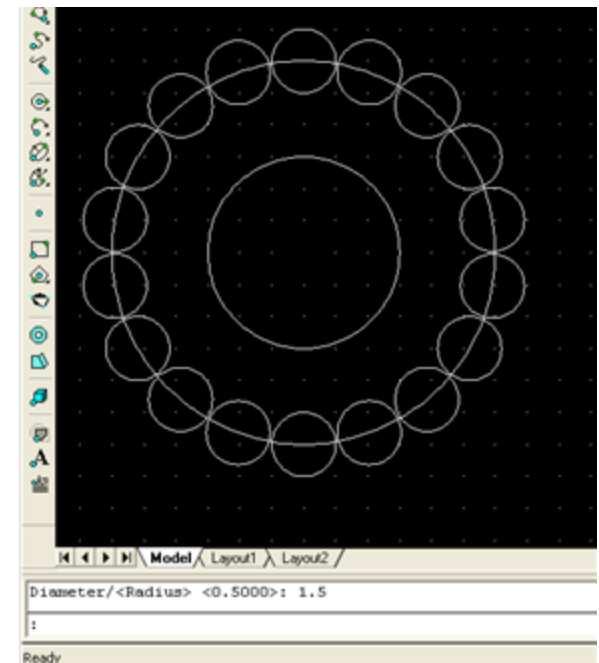


OR



Pick the CENTER of the large circle for your beginning PICK and then type in 1.5 then ENTER to enter the RADIUS of the circle.

Note: You can also use the "LENGTH" value in the STATUS BAR at the bottom of the A+CAD window to size the circle.



Lesson 3: Create a 3D Gear

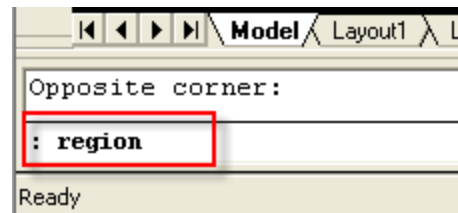
Draw 2D Objects continued:

Next we will make our objects into a REGIONs. A REGION will allow for BOOLEAN operations such as UNION and SUBTRACT.

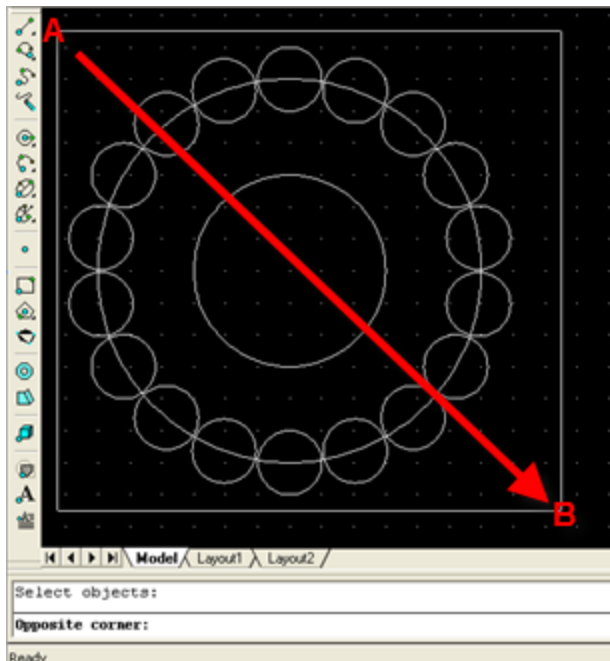
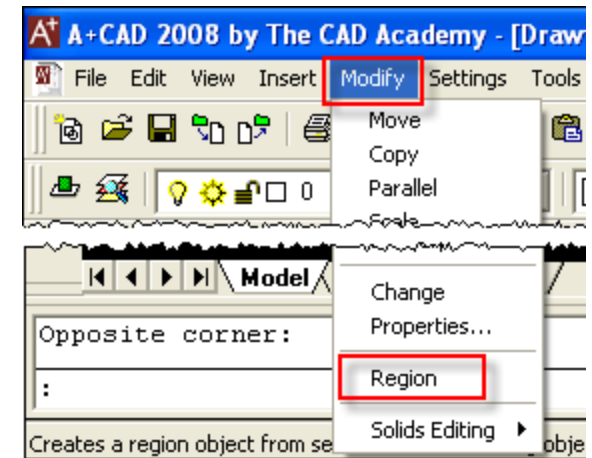
The REGION command:

Type REGION at the Command Line and the ENTER.

Note: You can also select REGION from the MODIFY Pulldown Menu.

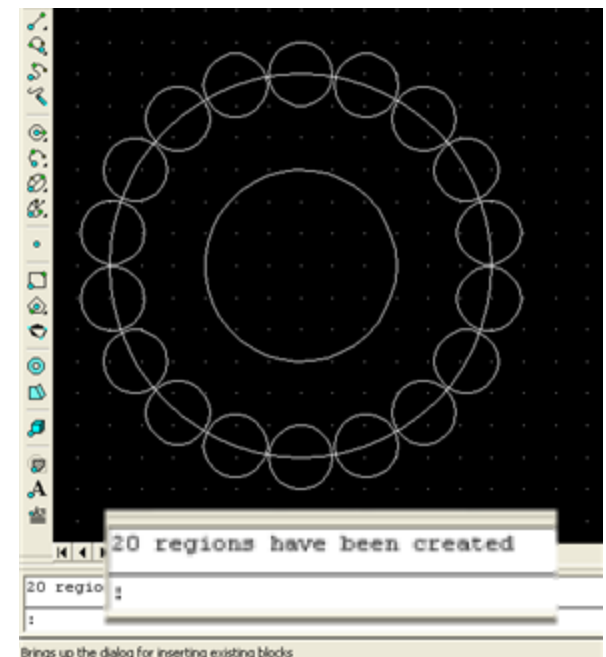


OR



"Window" all objects in the drawing. Pick a point at the UPPER LEFT (A), drag the crosshair (cursor) to a point at the LOWER RIGHT of the objects (B) and PICK point B, then hit ENTER.

Note: You can also type ALL then hit ENTER at the Command Line to select all objects in the drawing.



Lesson 3: Create a 3D Gear

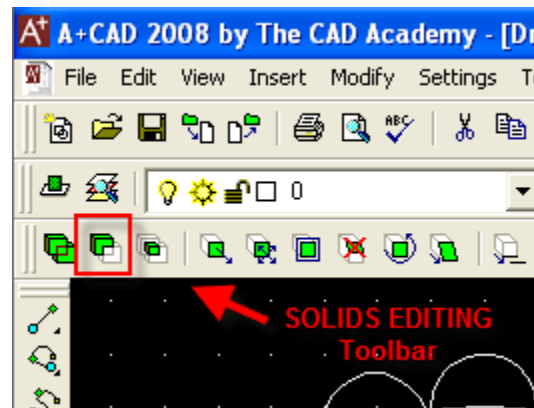
Draw 2D Objects continued:

The SUBTRACT command:

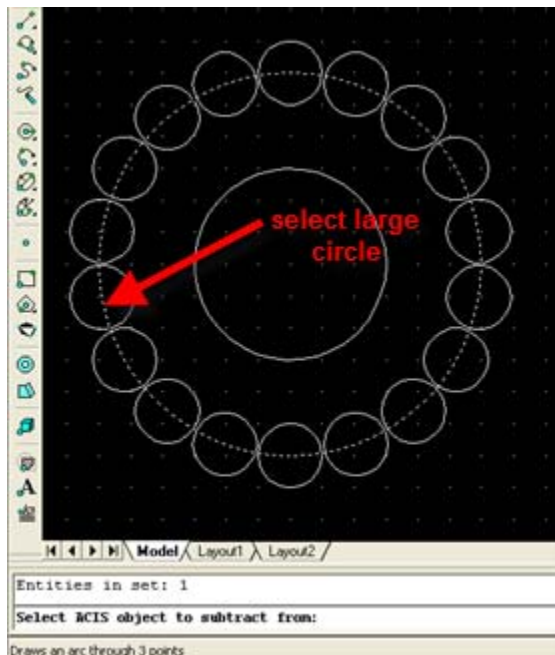
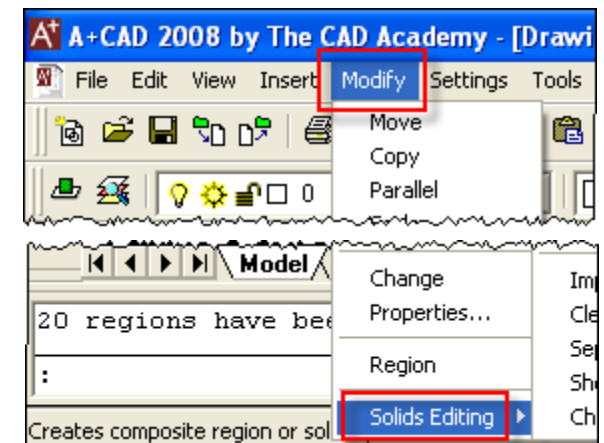
Turn ON the SOLIDS EDITING Toolbar using the skills learned in previous steps. (Right Click on any toolbar button and pick SOLIDS EDITING)

Select SUBTRACT from SOLIDS EDITING Toolbar.

Note: You can also select SUBTRACT from the MODIFY Pulldown Menu.

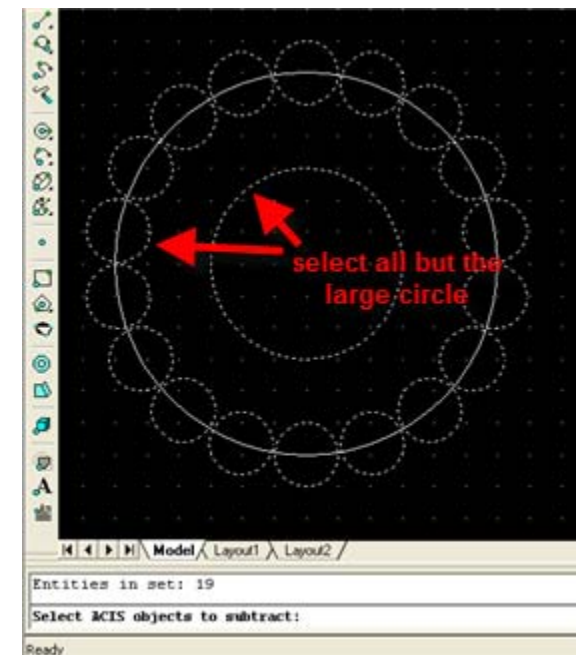
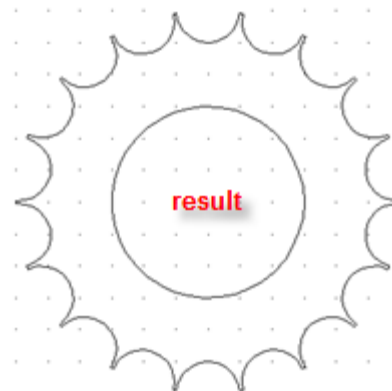


OR



SELECT the LARGE CIRCLE as shown in response to the ACIS object to SUBTRACT from and ENTER.

Select all of the SMALL circles AND the interior CIRCLE as objects to SUBTRACT and press ENTER.



Lesson 3: Create a 3D Gear

Create 3D Object:

The EXTRUDE command:

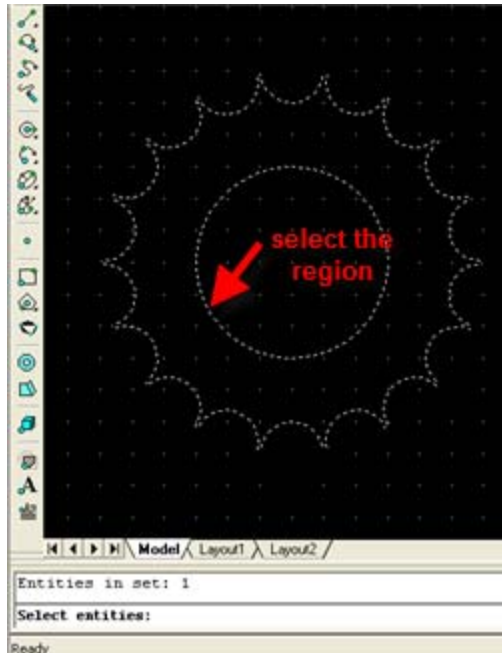
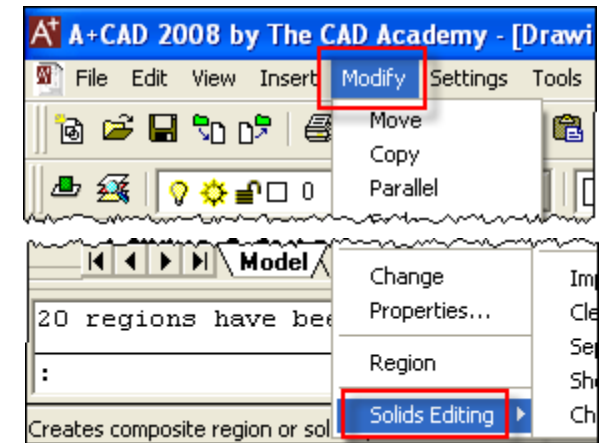
Next will place some THICKNESS to the OBJECT by using the EXTRUDE command.

Type EXTRUDE at the Command Line then hit ENTER.

Note: You can also select EXTRUDE from the MODIFY Pulldown Menu or the SOLIDS Toolbar.

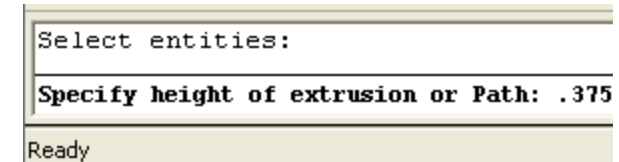


OR

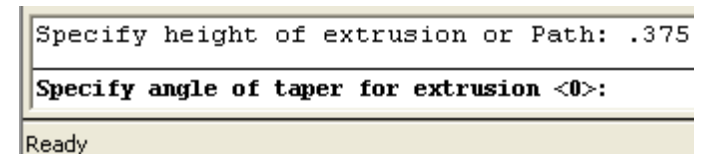


SELECT the REGION and hit ENTER.

Type **.375** for the HEIGHT and hit ENTER.



Hit ENTER again for the ANGLE. This will accept the default value of **0**.



Lesson 3: Create a 3D Gear

View the 3D Gear:

Isometric view:

Select AERIAL, RIGHT FRONT from the VIEW Pulldown menu. (View > Look From > Aerial, Right Front.)

Hidden View:

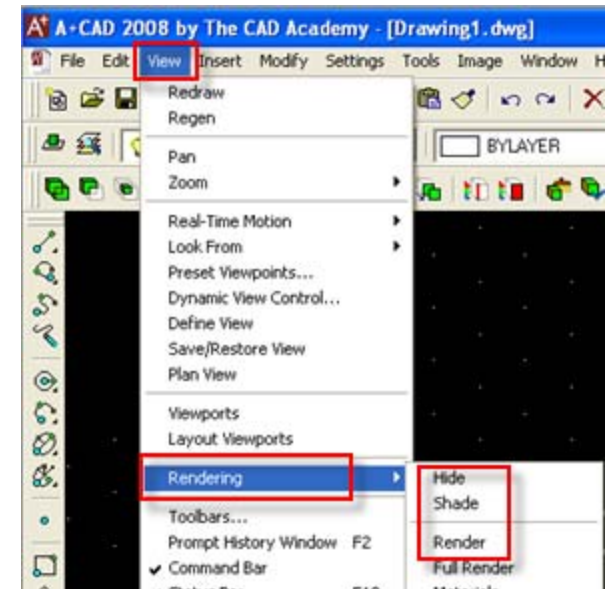
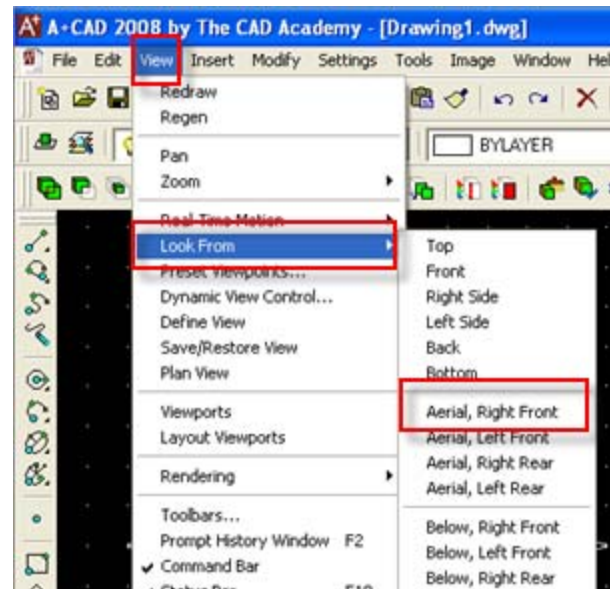
Select HIDE from the View Pulldown menu. (View > Rendering > Hide)

Shaded View:

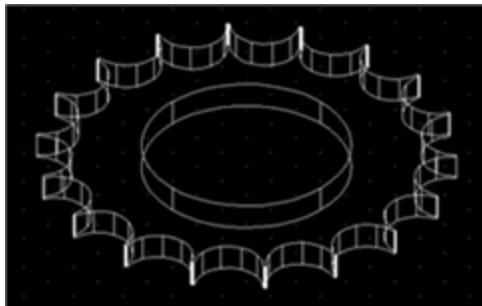
Select SHADE from the View Pulldown menu. (View > Rendering > Shade)

Rendered View:

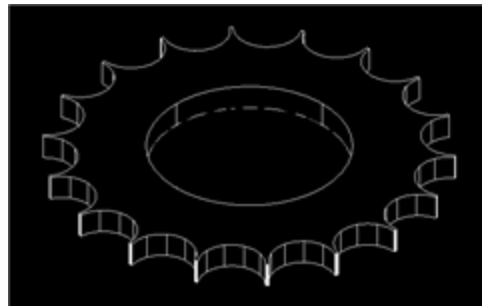
Select RENDER from the View Pulldown menu. (View > Rendering > Render)



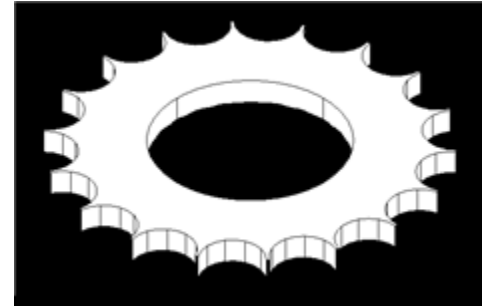
Isometric



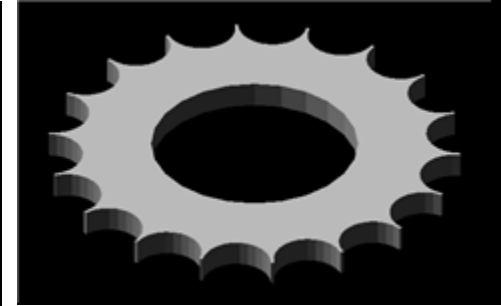
Hidden



Shade



Render



Lesson 3: Create a 3D Gear

The Model:

We can also find out MASS information on our model. First we type in REGEN at the command line to bring back our model. Right click on any tool as shown as bring up the INQUIRY tool.

Mass Properties:

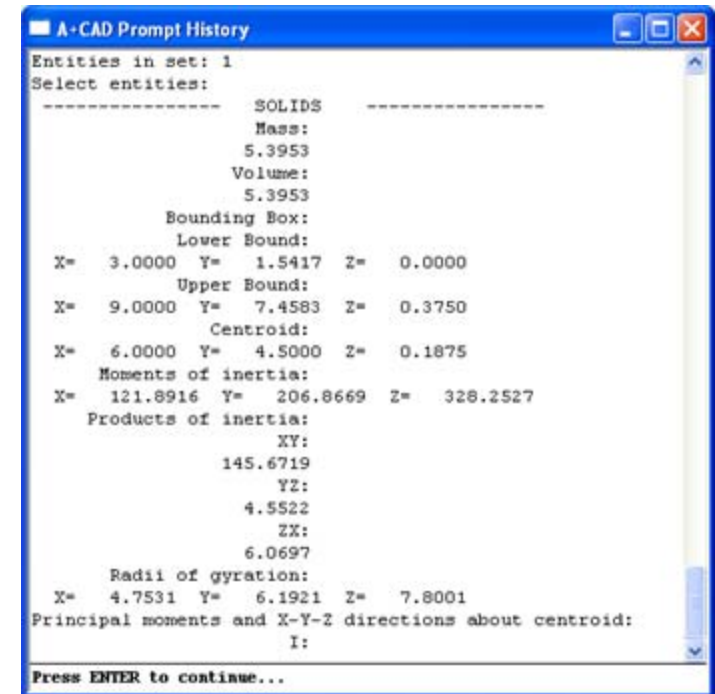
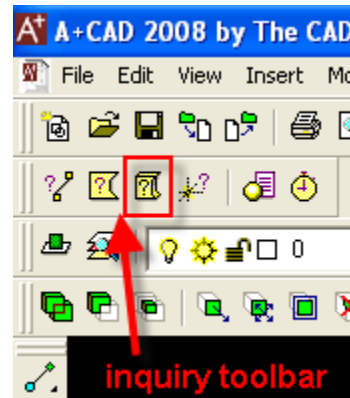
Turn ON the INQUIRY Toolbar by right clicking on any toolbar button and selecting INQUIRY.

Select MASS Property from the INQUIRY toolbar and select our GEAR and press ENTER.

Note: You can also type MASSPROP at the Command Line.

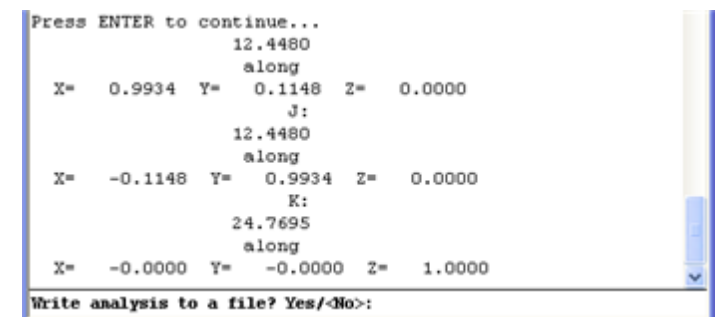


OR



This is great information that would be difficult to figure out if this was not a SOLID MODEL. Notice the Volume and mass – the center of gravity and also moments.

This information can be taken to a FINITE ELEMENT ANALYSIS by printing it to a file and figure STRESS or weaknesses in our model.

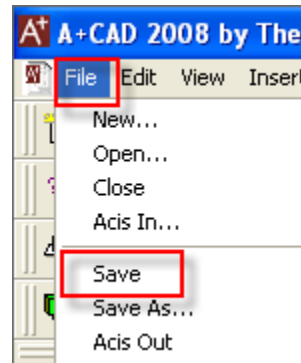


Lesson 4: Page Layout

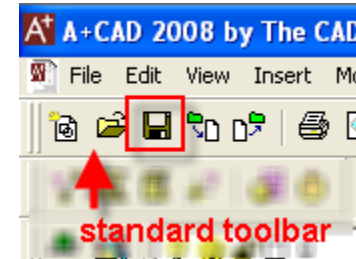
Create a Title Sheet:

Save your work:

Select SAVE from the File Pulldown menu. Save the drawing and name it GEAR.



OR



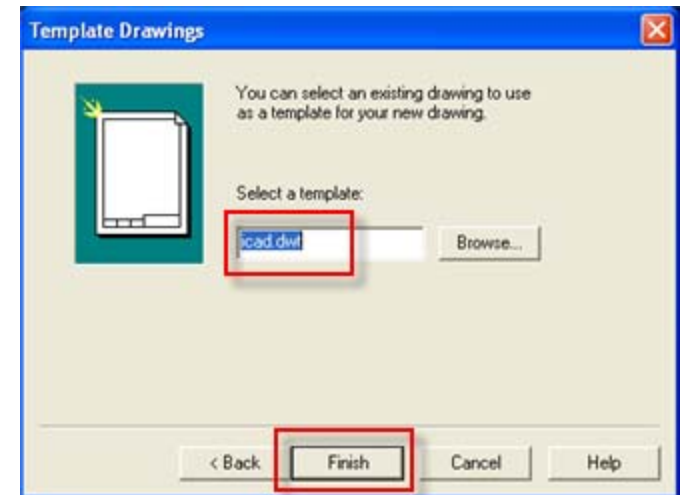
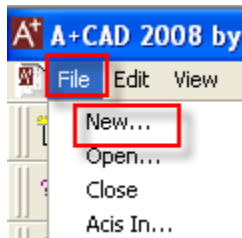
Create a new drawing:

Select NEW from the File Pulldown menu.

Select USE A TEMPLATE DRAWING, the NEXT.

Select FINISH to complete the wizard. The ICAD.DWT is the default drawing template for A+CAD.

You now have two drawings open in A+CAD.

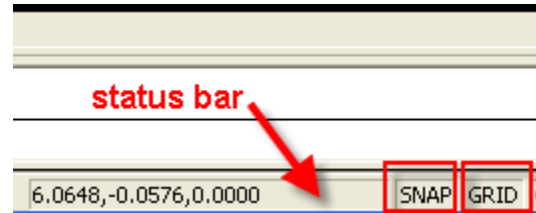


Lesson 4: Page Layout

Create a Title Sheet continued:

Enable GRID and SNAP:

Double click on both the SNAP and GRID buttons at the bottom of the A+CAD Window. (Status Bar)
By default the grid and snap units will be .5



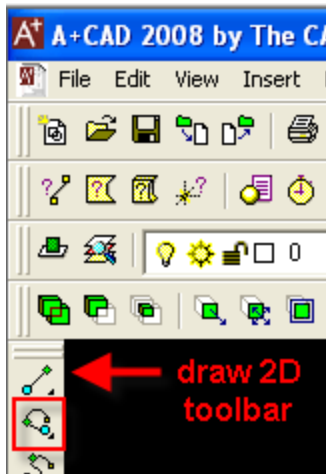
Change the area for the GRID:

We want our GRID to represent our 8.5"x11" sheet.
Type LIMITS, then ENTER at the Command Line.
For the Lower Left Corner hit ENTER to accept the current value of 0,0. For the Upper Right Corner type 11, 8.5

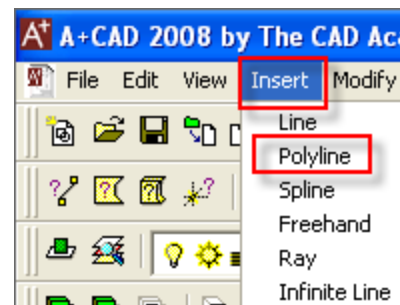
```
: limits  
Limits are off: ON/<Lower left corner> <0.0000,0.0000>:  
Upper right corner <12.0000,9.0000>: 11,8.5
```

Draw a rectangle using POLYLINE:

Select POLYLINE from the DRAW menu. We are going to draw a line 1 unit in or 2 grid segments because a plotter or printer can't print on the edge of the sheet of paper. Rectangle size 7.5x10 units.



OR

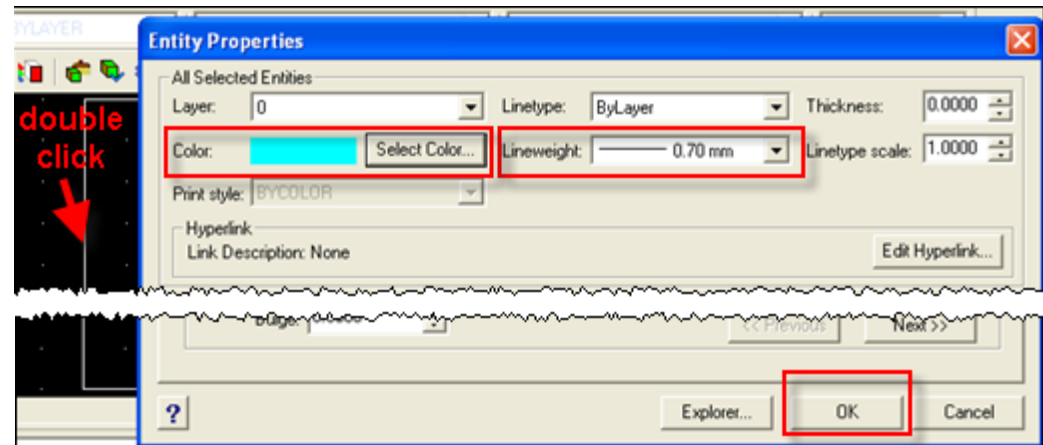


Lesson 4: Page Layout

Create a Title Sheet continued:

Change the line width and color of the rectangle:

When finished double click anywhere on the LINE and the following menu will appear. We want to change the LINEWEIGHT to .70 and change the color of our rectangle to CYAN or color 4 be sure to select OK when finished.



Enable the display of LINEWEIGHTS:

Double click on the LWT button on the STATUS BAR.

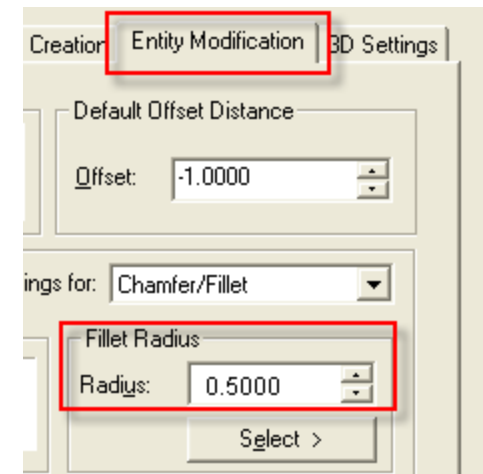
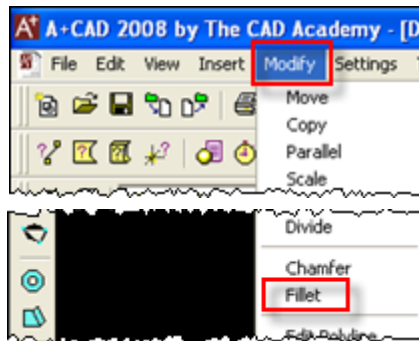


Modify the rectangle:

Many professionals prefer rounded corners on their border so we are going to select FILLET and round the corners.

From the MODIFY pull down select FILLET. Type S to change the RADIUS Setting to 0.5, then OK to close the dialog.

Type P, then hit ENTER to select the Polyline Option of the FILLET command. Select the rectangle, then hit ENTER.



Lesson 4: Page Layout

Create a Title Sheet continued:

Modify the rectangle continued:

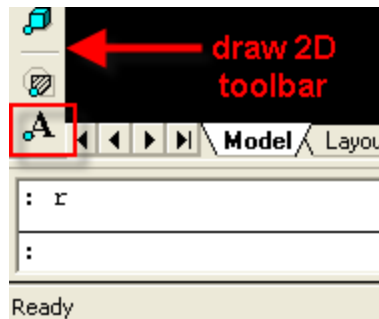
After changing the RADIUS setting, type **P** and hit ENTER to enable a polyline fillet.

Select the rectangle to complete the command.
Your rectangle should now look like the illustration to the right.



Create a title using the TEXT command:

Select the TEXT command from the DRAW 2D Toolbar or from the INSERT Pulldown menu. (INSERT > TEXT)



Lesson 4: Page Layout

Create a Title Sheet continued:

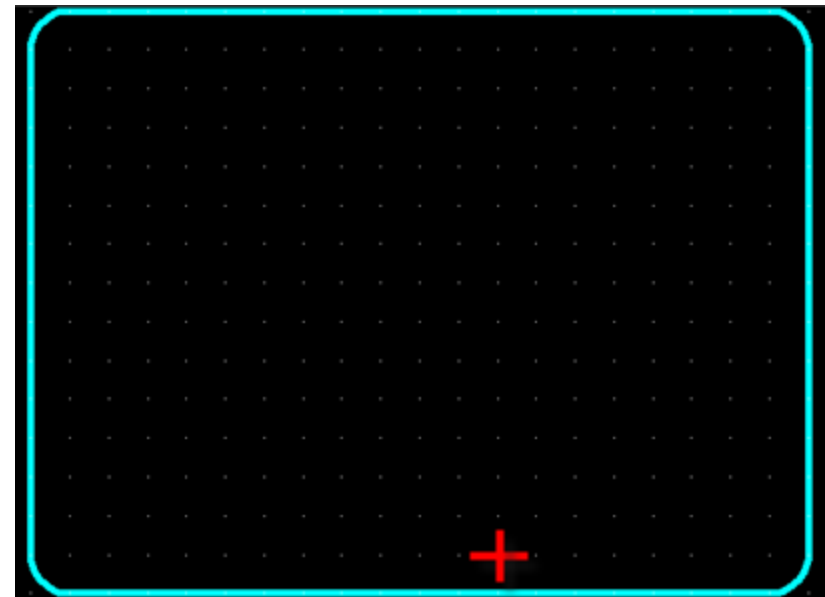
Create a title using the TEXT command continued:

Normally we would setup to enter drawing name, drawn by etc., but for our purposes here we will use the text command and type in "A" Size sheet.

Pick a point in the lower right hand side as shown for the starting point of the text.

Press ENTER for text height of .2 – press ENTER for rotation angle of 0 .

Type in "A" Size Sheet for text and press ENTER TWICE.



Results should be as shown in the illustration on the right.

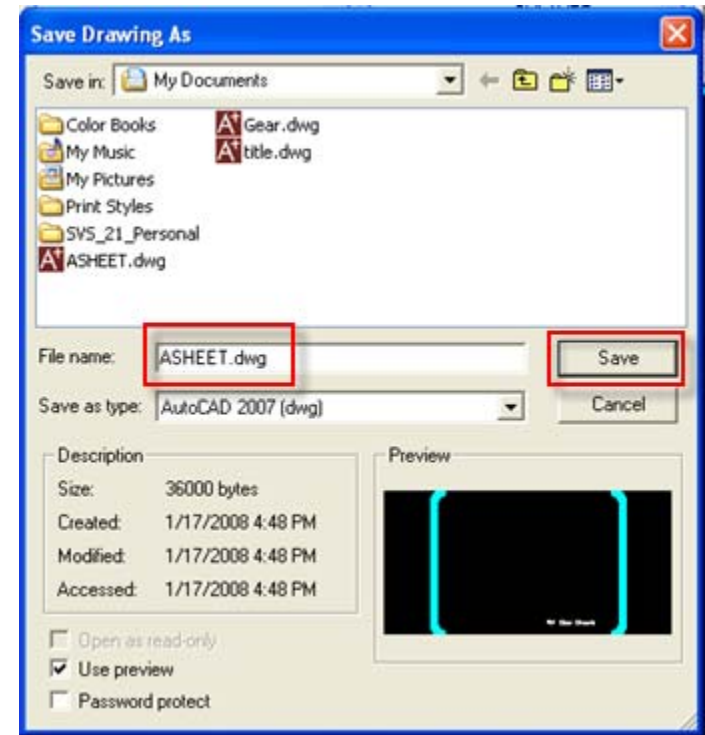
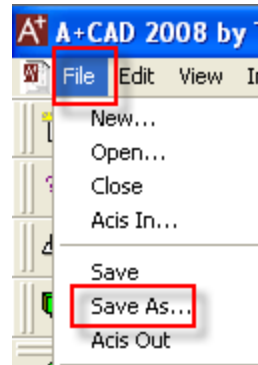
Lesson 4: Page Layout

Create a Title Sheet continued:

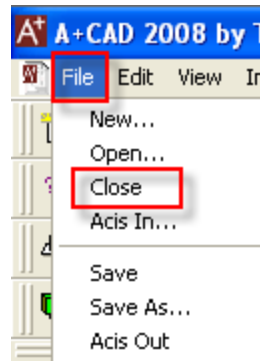
Save the title sheet drawing:

Select SAVE AS from the FILE pull-down menu and save our drawing as ASHEET.

Make sure you know where you are saving this drawing.



You may now select FILE and CLOSE to close our title block.



Lesson 4: Page Layout

Layout:

Insert the title sheet into the layout:

You should now be back at LAYOUT1 in our GEAR drawing. We are going to insert our "A" size border here as a title block. Notice that you make it once and then you re-use this title block any time you need to print an "A" size SHEET.

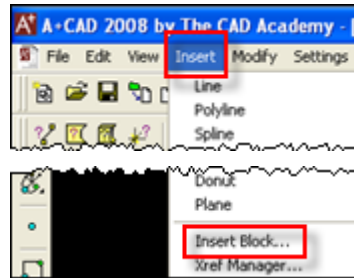
Select INSERT BLOCK from the INSERT Pulldown menu or type INSERT at the Command line and press ENTER.

Select BROWSE from the list of options.

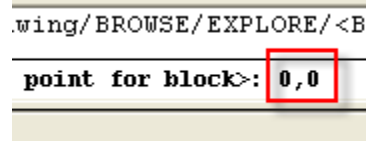
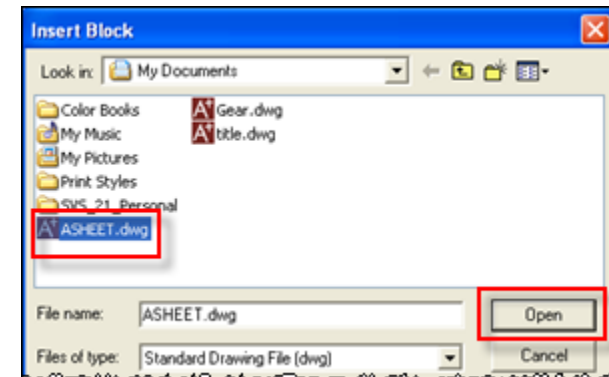
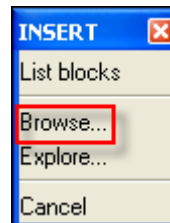
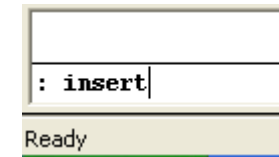
Browse to the ASHEET.DWG and choose OPEN.

Type 0,0 for the INSERTION POINT and the press ENTER.

Press ENTER three more times to accept the default values for X and Y scale factors, and rotation.



OR



Lesson 4: Page Layout

Layout:

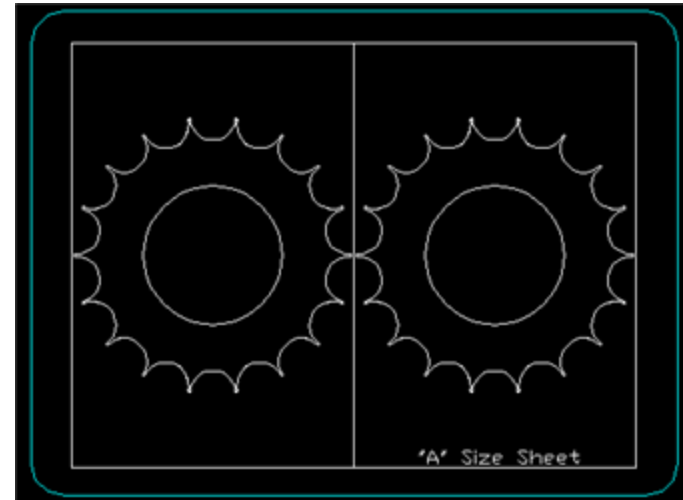
Create Viewports:

Type in MVIEW at the COMMAND line.

TYPE in **2** for two viewports.

Press ENTER to accept the default value of VERTICAL.

Pick a point at A then at B (shown below).



Lesson 4: Page Layout

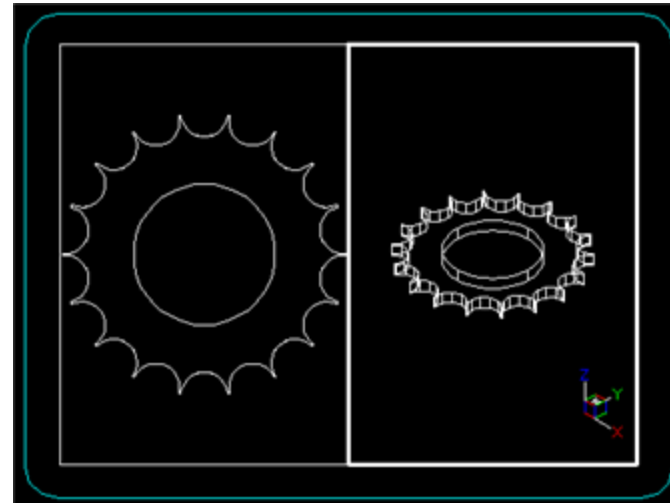
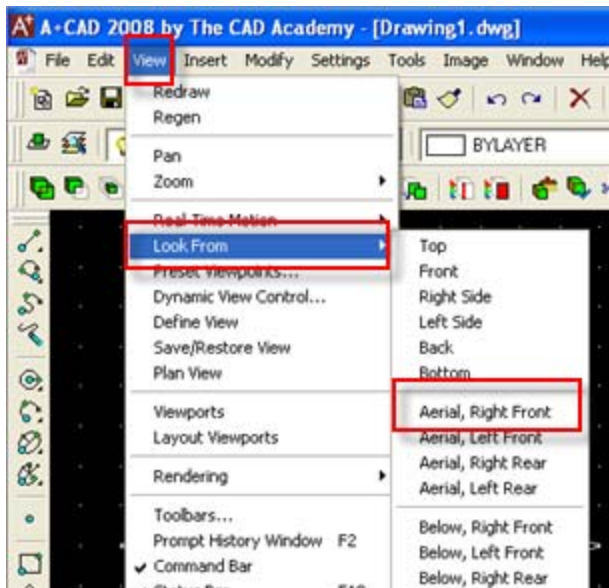
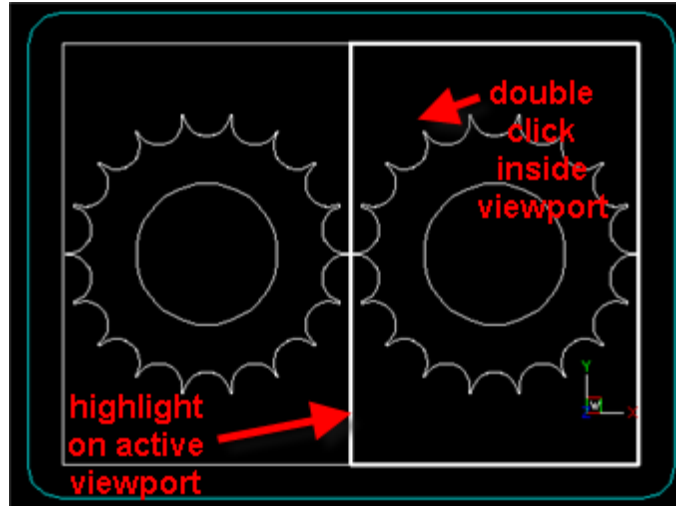
Layout:

Change the view of a Viewport:

We will have one viewport display a PLAN view and the other an ISOMETRIC view of our gear. This is an advantage of LAYOUTS.

Double click on the viewport on the RIGHT to make it ACTIVE. You will know it is active because the line will HIGHLIGHT.

Select AERIAL, RIGHT FRONT from the VIEW Pulldown Menu. (View > Look From > Aerial, Right Front)



Lesson 4: Page Layout

Layout:

Scale the Viewports:

The goal is to print the LEFT Viewport at **.5:1** and the RIGHT Viewport at **.75:1**.

The ZOOM command is used to scale the Viewports for printing.

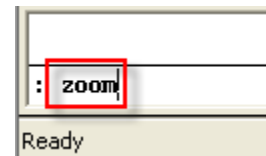
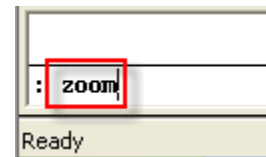
The RIGHT Viewport should still be active.
At the Command Line type ZOOM, then press ENTER.
Type **0.75xp** then press ENTER.

Double click in the VIEWPORT on the LEFT to make it ACTIVE.

At the Command Line type ZOOM, then press ENTER.
Type **0.5xp** then press ENTER.

Enable the display of LINEWEIGHTS:

Double click on the LWT button on the STATUS BAR.



Lesson 4 is complete!

