

Topics covered in this Lesson:

Creating a Building in 3D

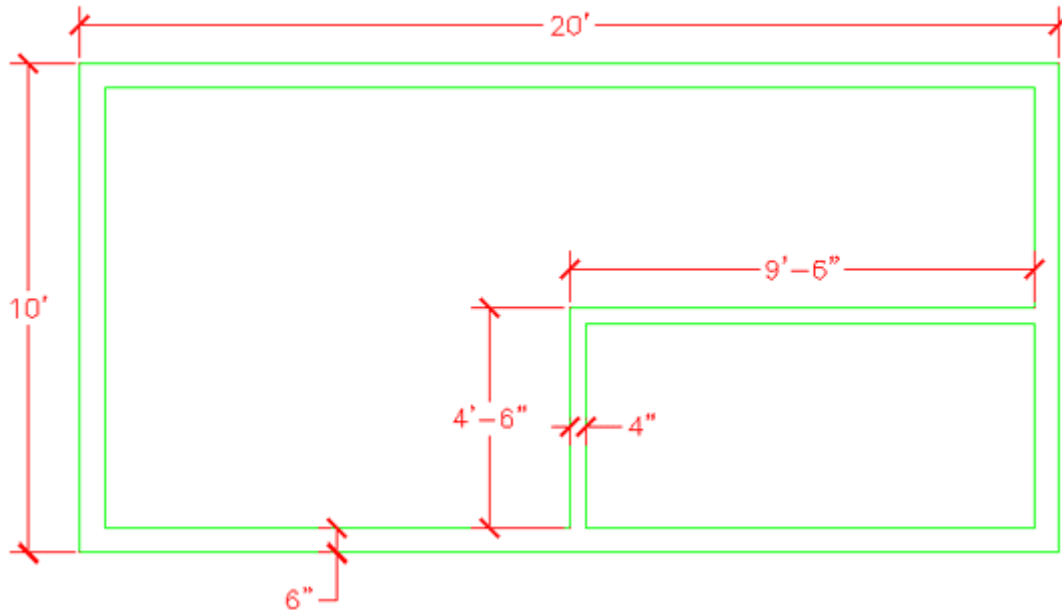
If you have completed the previous lessons in this level, you now have the tools to create a large variety of objects in 3D. This lesson is designed to show how to create simple building in 3D from start to finish. The same process can be used to build more complex buildings as well.

Below is an image of the final building that is explained in this lesson.



Start by setting your units to architectural (**DDUNITS**). Remember to create new layers for each type of objects you will draw (windows, doors, walls, roof, etc). Also use the "Render > Visual Styles > Realistic" option when adding materials.

Now draw the bases of the walls using the dimensions are shown below. You don't need to dimension it. Optionally, you can use the (new in AutoCAD 2007) **POLYSOLID** command.



Now you will create regions out of all your wall lines.

```

Command: REG REGION
Select objects: <SELECT ALL THE LINES> Specify opposite corner: 7 found
Select objects: <ENTER>
3 loops extracted.
3 Regions created.

```

You should now have 3 regions. If you don't then it usually means the your lines don't meet.

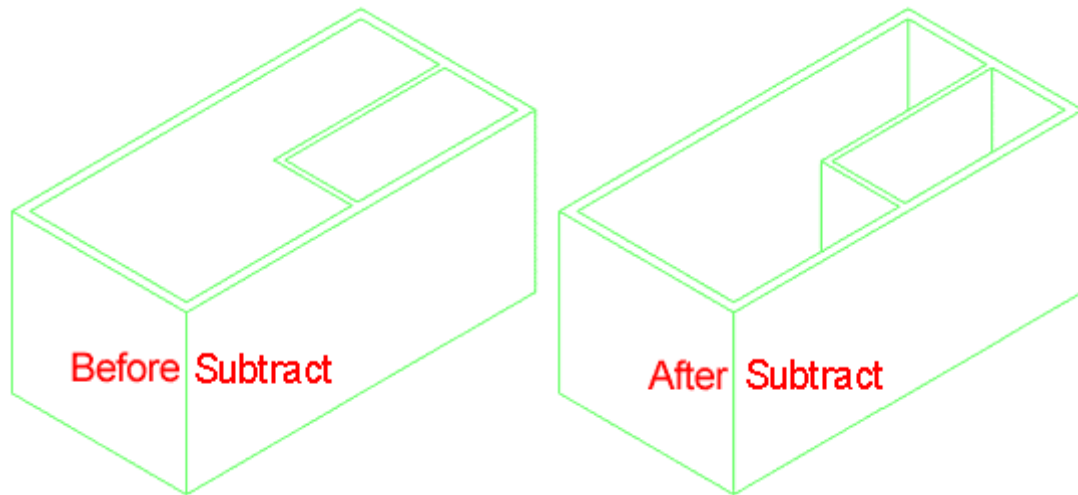
Next you are going to **EXTRUDE** the walls 9' high.

```

Command: EXT EXTRUDE
Current wire frame density: ISOLINES=4
Select objects: <SELECT THE 3 REGIONS> Specify opposite corner: 3 found
Select objects:
Specify height of extrusion or [Path]: 9'
Specify angle of taper for extrusion <0>: <ENTER>

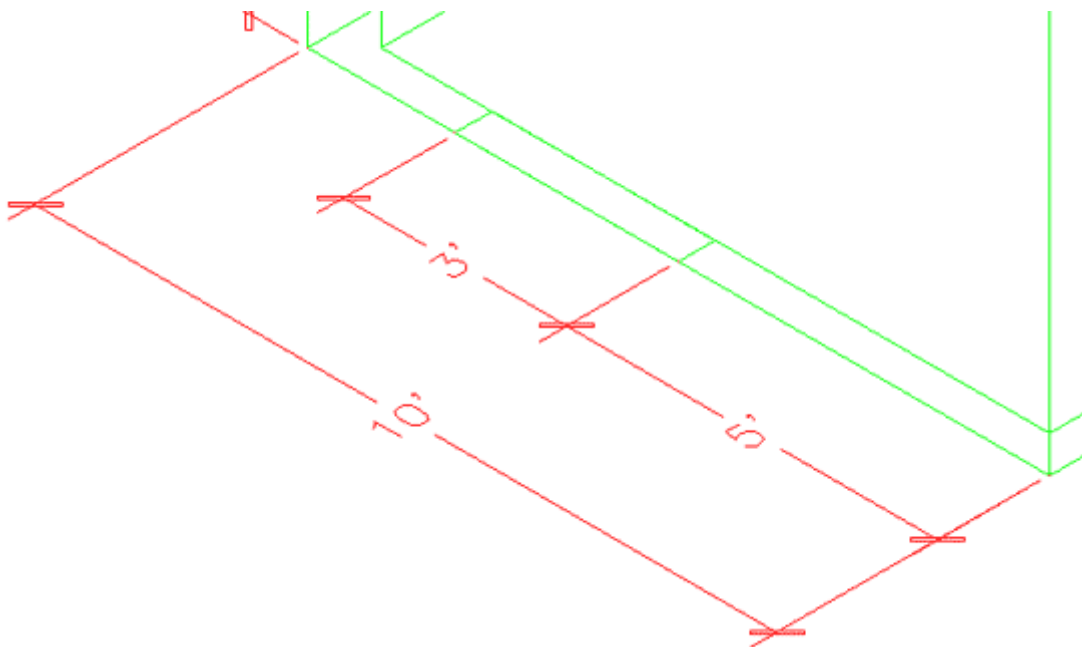
```

It should appear that nothing has happened. You will need to go to the **SW Isometric** view to see how the wall were extruded. Do this and then use the **HIDE** Command. Something doesn't look right. What you will need to do is **Subtract** the 2 smaller regions from the larger region. You should see this result after the Subtract and Hide commands.



Now it's starting to look like something. Your walls are almost complete.

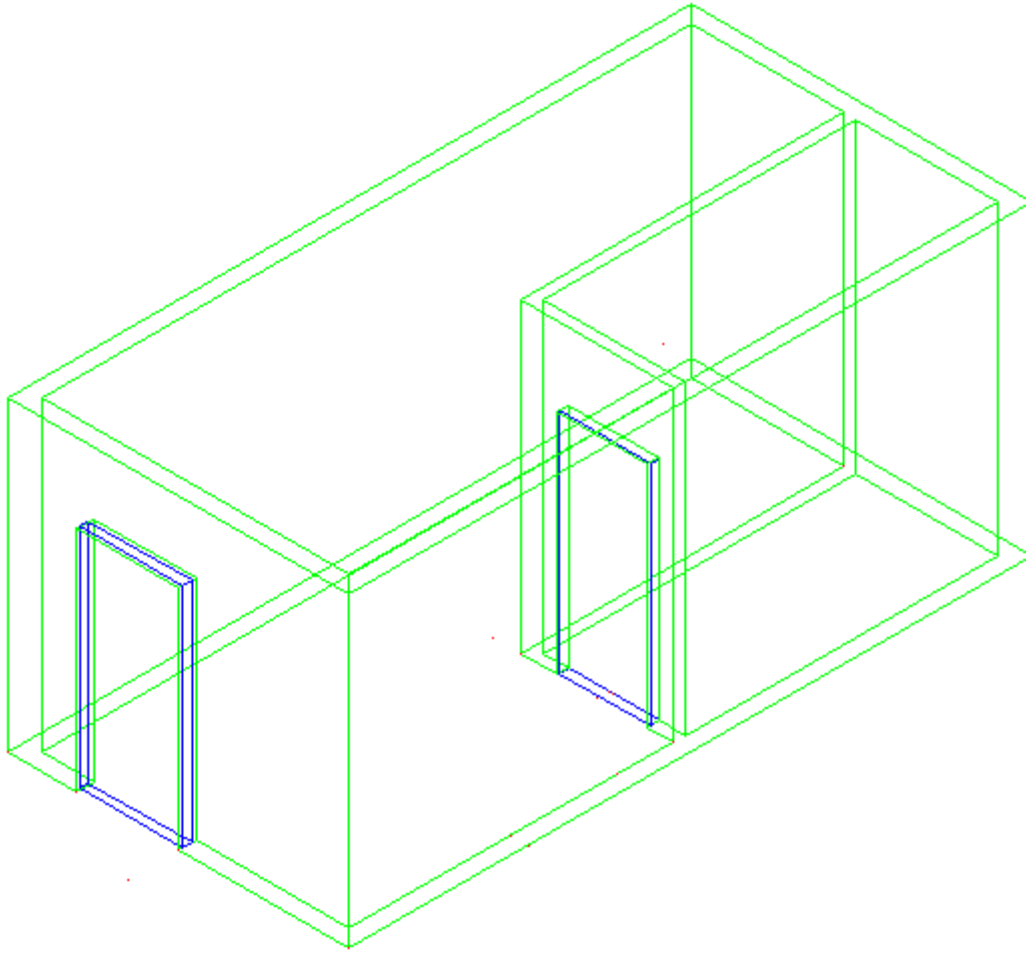
Next you will add a door or two. The first door, on the outside will be on the bottom left wall. Start by drawing a rectangle from the middle of the outside wall and the other corner @ **6, 36** - this will create the opening. Your rectangle should look like this:



Now you want to **EXTRUDE** the rectangle up 6'8" and **SUBTRACT** it from the wall.

Create a door layer (or make it active if you already have one) and draw a rectangle in the door opening that is 3"x 3' - put it in the middle of the door opening. Extrude it 6'8".

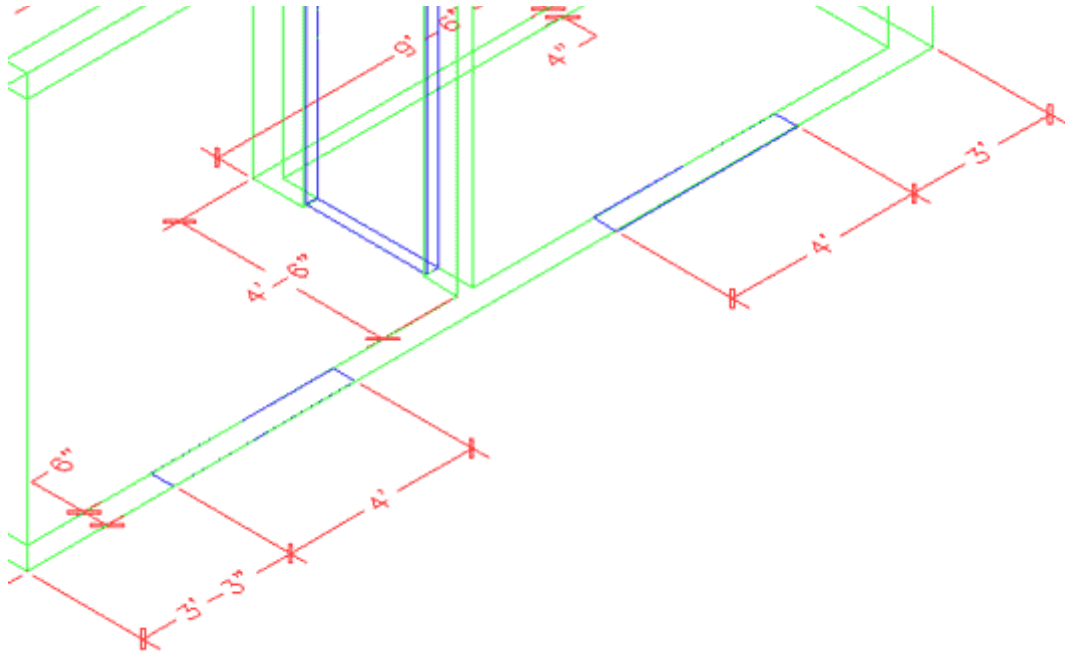
Now create a second door (and opening) on the inside wall parallel to the outside wall that is 32" wide. After you do that, the drawing should look like this from the SW Isometric view:



If you haven't saved your drawing yet, now would be a good time.

Now you're going to add some windows. This will be done using a similar process as the door. You will create openings, then add the window.

Create 2 rectangles in the position shown below.



EXTRUDE the window 36 inches. Then move them up 3'8" in the Z axis. Remember your relative co-ordinates from [Lesson 1-1](#)?

Command: **M**

MOVE

Select objects: 1 found

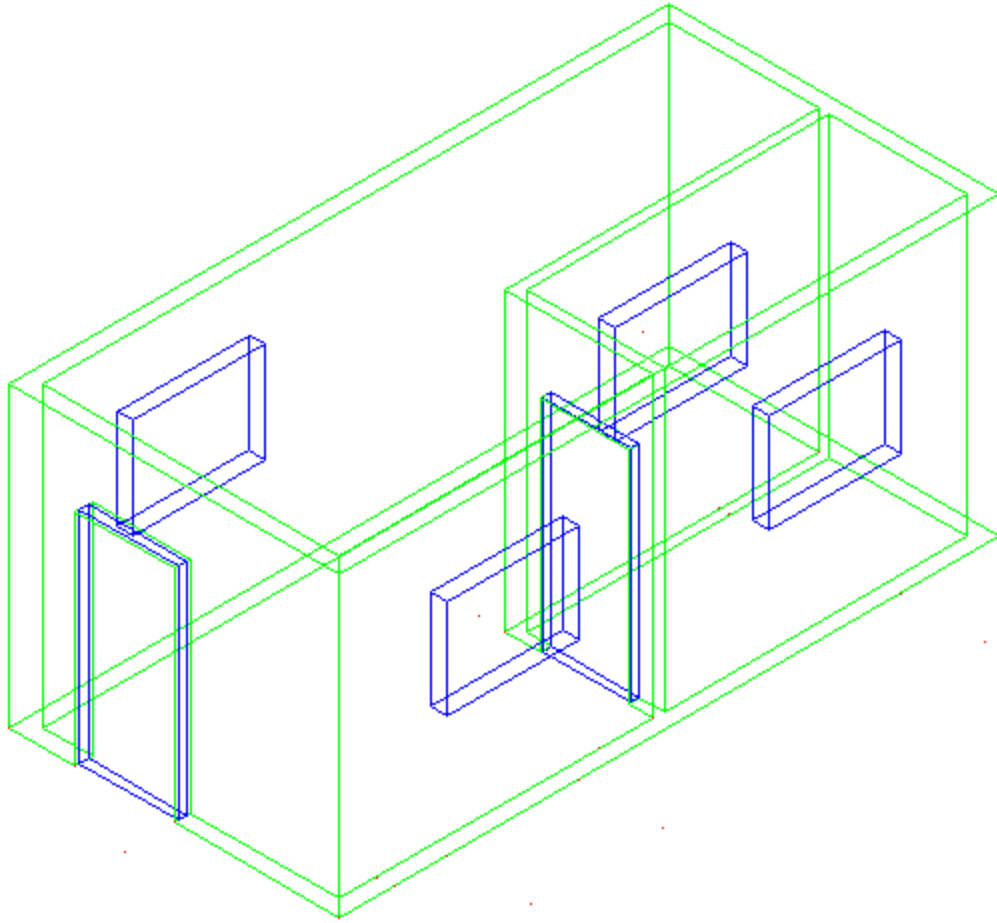
Select objects: 1 found, 2 total

Select objects: Specify base point or displacement: **<PICK ANYWHERE ON SCREEN>**

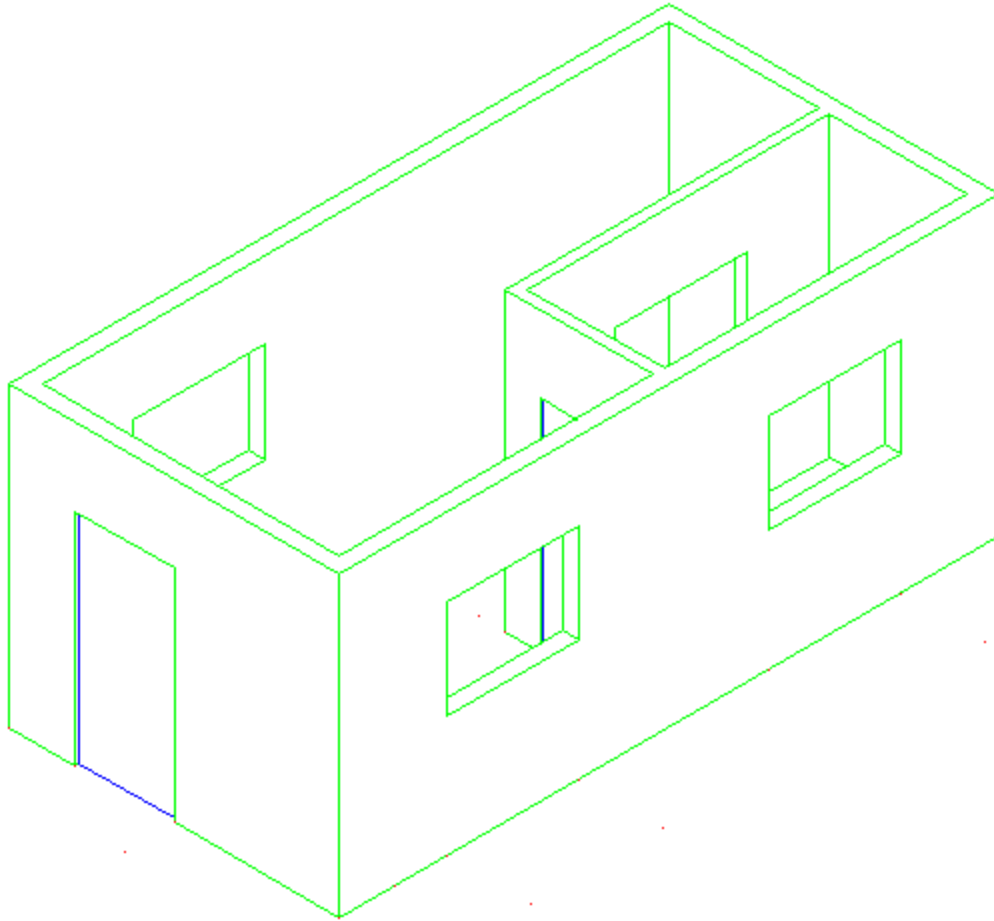
Specify second point of

displacement or <use first point as displacement>: **@0,0,3'8**

Now **mirror** the bottom left box to the opposite wall (Note: It will be easier if you revert to the top view for the mirror command) and the upper box to the inside wall so you have the 4 boxes looking like this :



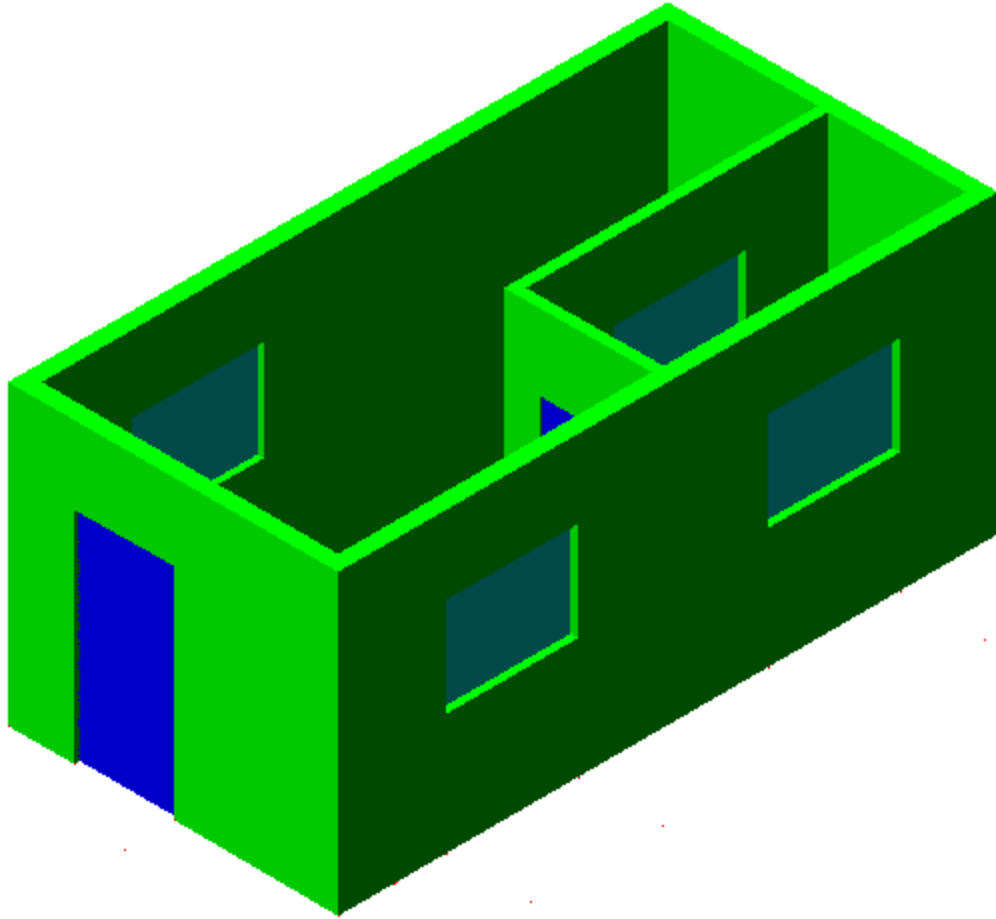
Next, subtract the four window openings from the walls. After switching to SW Isometric view and using the hide command, your drawing should look like this:



Now the window panes have to go in. Since this is a simple drawing, you just be putting in a plane of glass to represent the window.

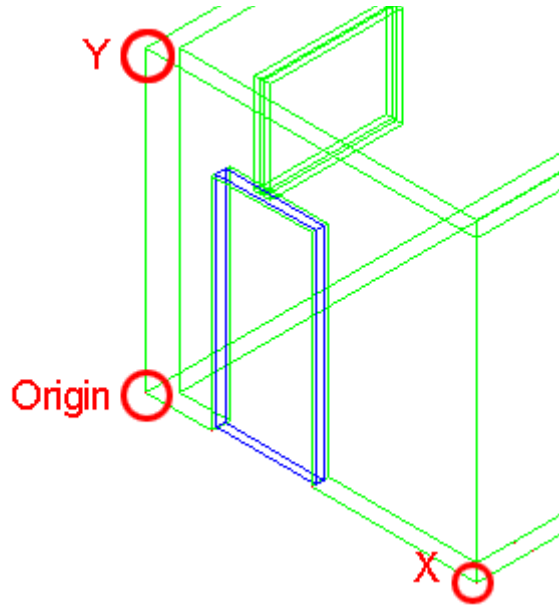
Create a new layer for windows. The easiest way to do this is just like you created the doors. Make the window 1" deep. Once again, start with the rectangle at the base of the window opening, extrude it the height of the window opening and move it into the centre.

Once you have one window made, copy it to the other openings. Save your drawing and then type in **SHADE** and choose the **G** option. Your building should look like this:



Wow - now you're getting there. Next you will add to the walls to make them the right pitch for the roof.

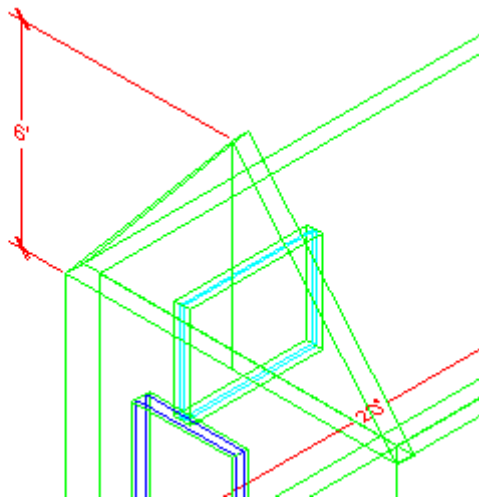
First you will have to change your **UCS**. Start the **UCS** command and choose the 3Point option by typing **3** <ENTER>. When prompted (watch the command line) select the points shown below:



After you pick the third point, the cursor should turn on its side. Now you can draw on the side of the building. In this case, you will be drawing a triangular shape to represent the rest of the wall up to the roof.

Draw a **LINE** from the middle of the top outside of the wall up 6'. Then draw a **POLYLINE** from one corner, to the next, to the top of the line and use the **C** option to close the polyline.

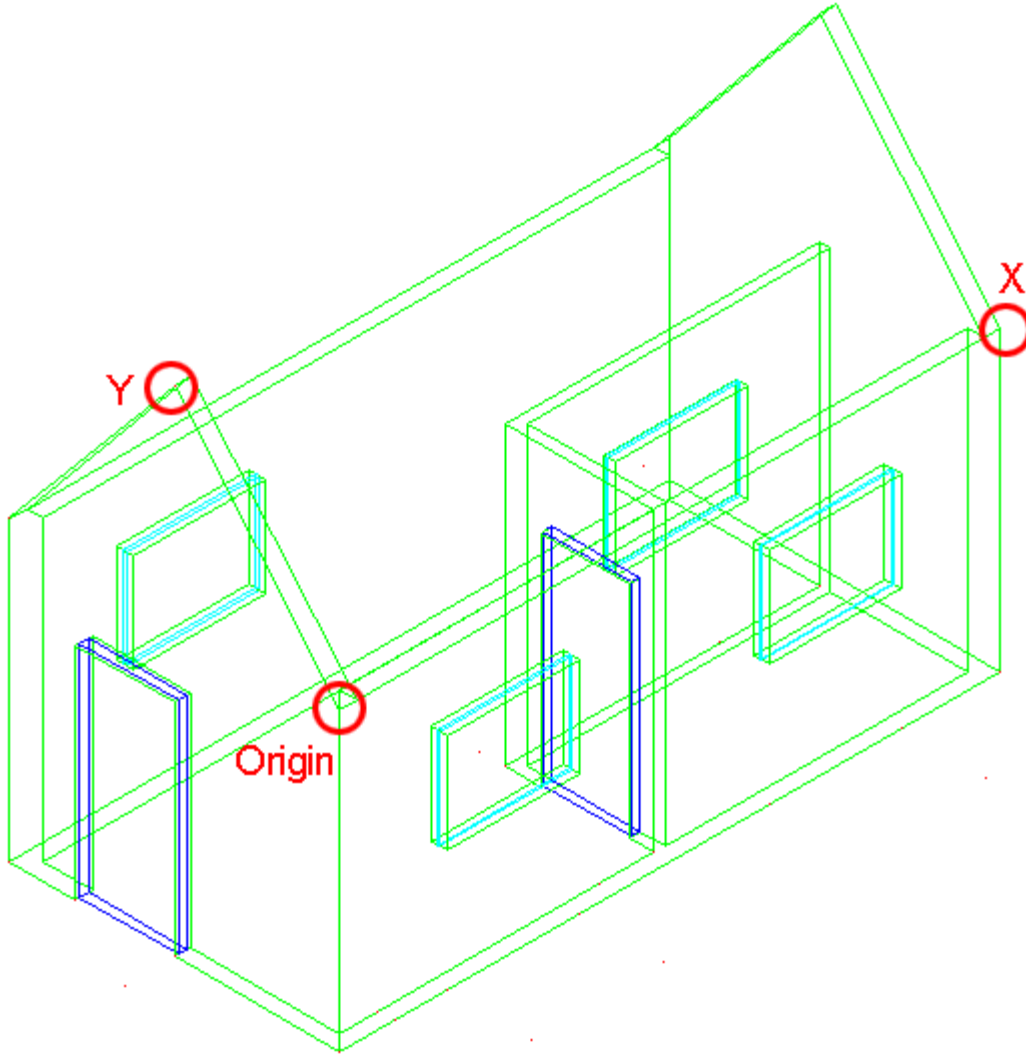
Finally **EXTRUDE** the triangle -6" and then **COPY** the extruded object to the other side of the building. Erase the vertical line you drew. You should have something like this now:



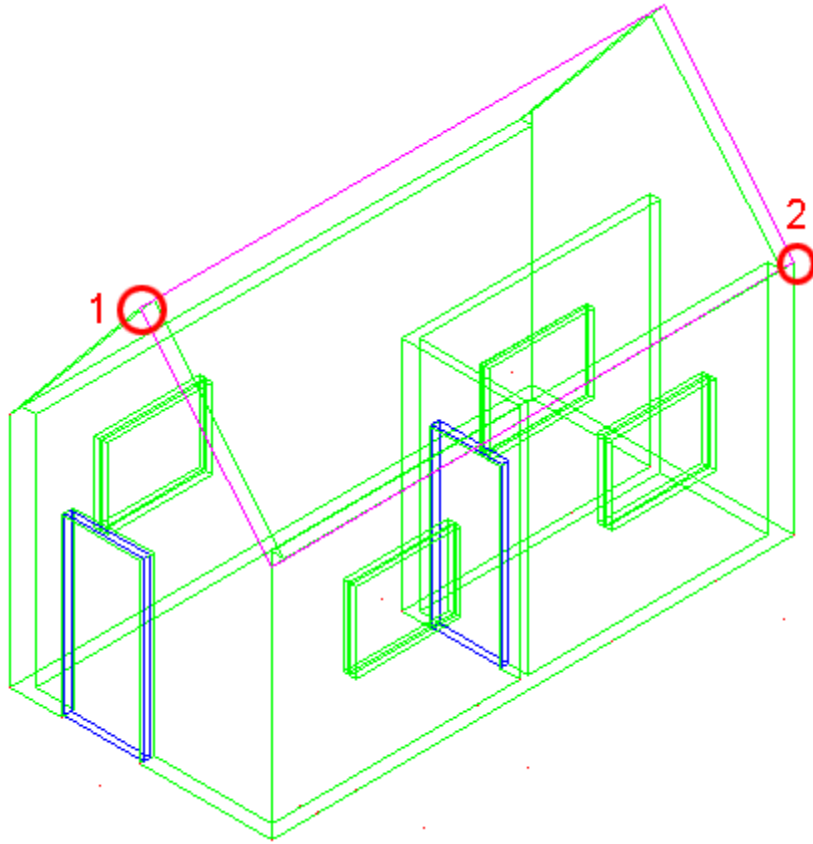
To finish the wall, perform a **UNION** ([Lesson 3-11](#)) between the triangular sections and the bottom wall.

You're almost done now. You will need to draw the roof to complete the drawing.

First you will need to change your **UCS** to align it with the slant of the roof. Use the points shown below - and be careful which endpoints you select.

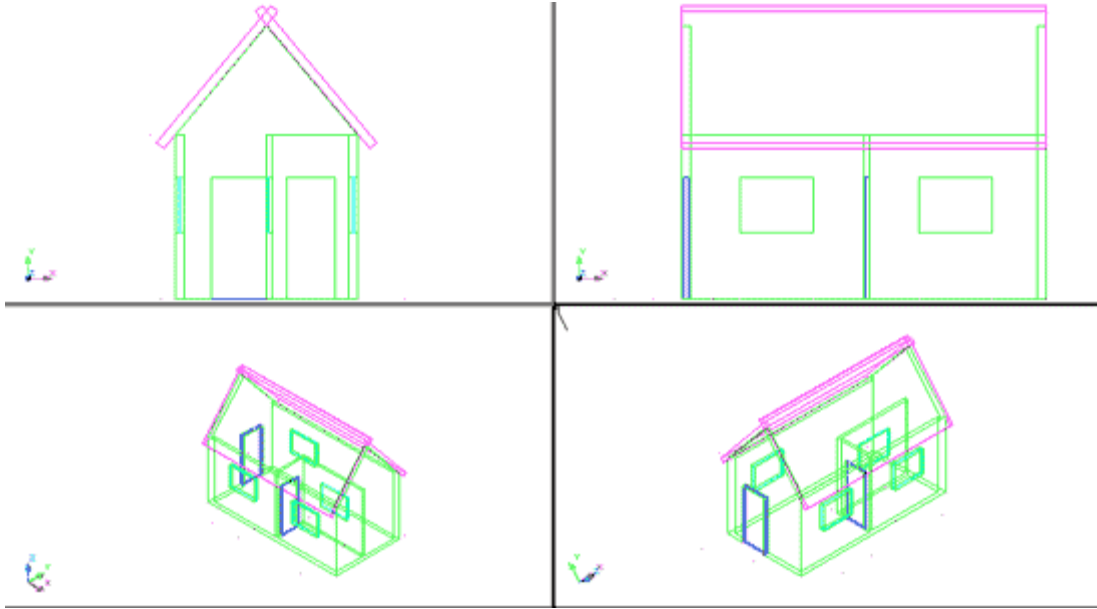


Now draw a **RECTANGLE** from the top left corner of the triangular shape to the bottom of the opposite corner of the other triangular shape. It should like the magenta rectangle below:



New **EXTRUDE** the rectangle 6". Then copy 12" down in the Y Axis and then copy it 12" up in the Y Axis - when you have the 3 sections **UNION** them into one object.

Change back to the WCS (**UCS <ENTER><ENTER>**) and mirror the roof object to the other side. Check that it looks correct by viewing the model from the left and from the front.



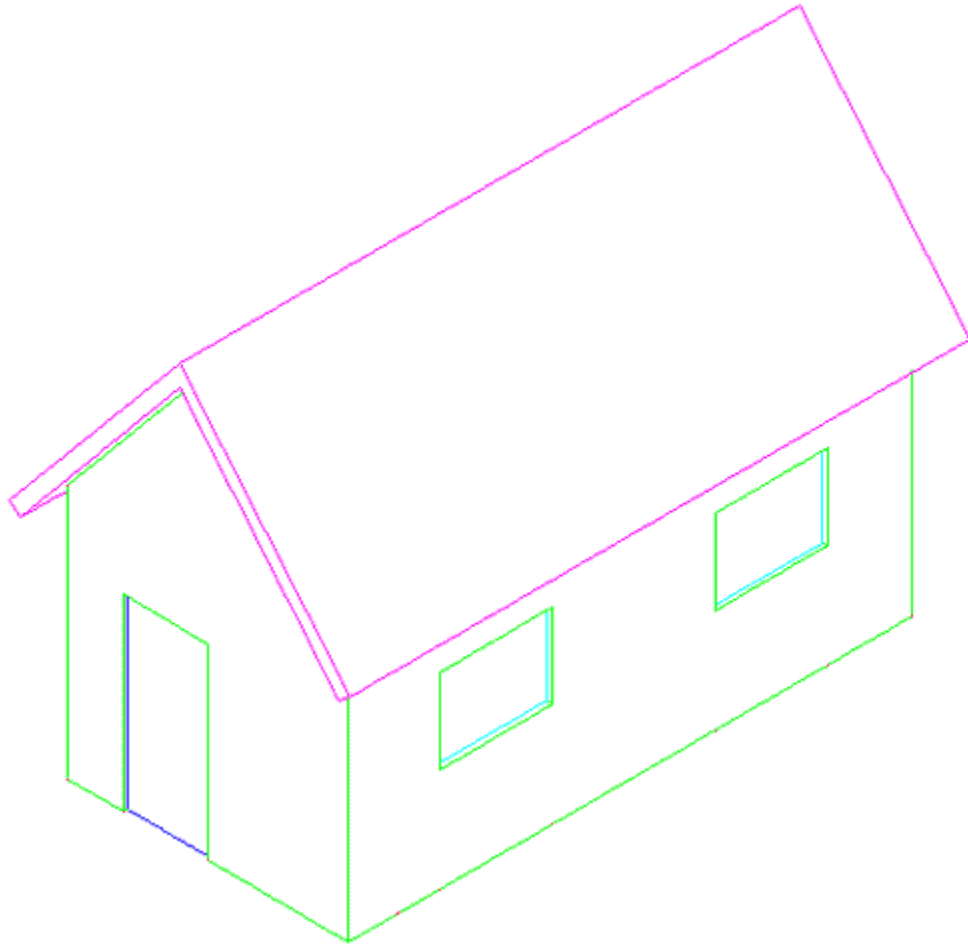
The last thing to do is trim the excess pieces off the top of the roof where the two slabs intersect. This will be done using the **SLICE** command ([Lesson 3-11](#)).

Go to the SW Isometric view.

Start the **SLICE** command and select the roof section towards the back. Then when you are asked to pick three points on the slicing plane, select any three points on the top of the roof section at the front.

Switch to the NW Isometric view and slice other roof section in the same manner. Check to see that your roof looks correct, and if it is, union the two roof objects now.

Go to the WCS and copy the roof 12" in the Positive X Axis and 12 " in the Negative X Axis and then union all 3 roof objects. Your building should now look like the one below:



Your building is complete. To add a lawn , draw a very large rectangle around the house at the same Z level as the bottom of the house. Then turn it into a region so that materials can be added later.

Save the drawing, then if you like, add materials and render the final image. In the image at the top of the lesson, the door is detailed material. More detailed instructions for rendering will be found in [Lesson 3-17](#).

Here are the materials used for the rendering at the top of the page. You can download them and add them to your Textures folder. The door texture would be used like the stop sign you may have rendered in [lesson 3-14](#).

[door.jpg](#) | [grey_roof_slate.jpg](#) | [grass.jpg](#) | [stucco_white.jpg](#)

You can also try to add more detail to the building if you like. But now you can see that using a few commands (in this case about 12), you can draw decent looking models.

Extra Practice: Build a 3D model of the Cabin Drawing from [Lesson 2-1](#). How much detail can you add? Door knobs? Window panes?