



Snug as a Bug in a Trug

Working with compound angles builds character, and you get a saucy antiqued garden trug as a bonus.

Compound angles are snack food for the mind. If you don't believe me, look at the mathematical formula for figuring out compound angles.

(WE'RE NOT GOING TO USE THIS.)

$$\sin(\alpha + \beta) \equiv \sin \beta \cos \alpha + \sin \alpha \cos \beta$$

Building something with compound angles is a great way to gain an "intuitive" understanding of woodworking, which means flatly ignoring the math constructs.

So it's time to get intimate with your circular saw. It's got capabilities you may not have dreamed of. It will shortcut the math and make you feel special in all the right ways.

Materials:

- 12' total of 1" x 6" pine
- 4' piece of scrap 2x4 for handle
- Eight 2" Antique [reproduction iron nails](#)
- Eight 1" Copper [boat nails](#)
- Carpenter's glue
- [Milk paint](#)
- Sandpaper

Tools

- Pencil
- Protractor
- Circular saw
(read [Mag's circular saw tutorial](#) or [watch the video](#))
- Jigsaw
- Safety gear
- Hammer
- Clamps

Cut List:

- Ends - Two 16" pieces
- Sides - Two 22" pieces
- Bottom - TRICKY - please see text
- Feet - Two 12" pieces
- Handle - Two 37" lengths ripped 1/16" - 1/8" thick

Steps:



Cut the boards to length and determine the angle



Using a protractor, scribe a 15 degree line



Cut along the line with a circular saw



Put the corners together, notice the top and bottom edges look geeky

The First Degree

Using a protractor, mark 15-degree angles on the ends of each of the boards that form the walls of your basket. Cut along the lines. Now, put one of the corners together. Everything good? NO. Because when you put the joints together, the top and bottom edges are no longer horizontal. In fact, they look stupid. Why? Because they need to be shaved off the exact 15 degrees that you tilted the joints. OKAY



To fit properly, the board profile should be a parallelogram



Adjust the shoe of the saw to 15 degrees



Use a ripping guide for straight cuts

So, in order to make the top and bottom edges horizontal, trim off the offending high and low corner edges of each board. To do this you must invoke the magic of your circular saw. Adjust the plate of the circular saw to 15 degrees using its bevel gauge and off come those nasty corner edges. When finished, the board should be a parallelogram with the top and bottom edge perfectly horizontal. With me so far?

Tip:

If your saw came with a ripping guide this is a crucial time to use it. It will guide the blade, making your cuts clean and straight.



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Compounding Trouble

Put the joints together again. Do they fit together perfectly? **NO THEY DON'T.** The inside corners are all open just a bit. This is because when the sides are tipped down 15 degrees and have a 15-degree angle, the inside corner becomes a compound angle! In order to close that gap, 3-3/4 degrees must be taken of the outside edge of the joint. 3-3/4 degrees is one quarter of 15 degrees. Because there are four corners, divide 15 degrees by four and you get 3-3/4 degrees. **IS THIS FUN OR WHAT!?**

A note to the suicidal: The gap is subtle enough that it really isn't essential to make that cut unless you're using thicker boards and it really shows up.



Antique reproduction nail



Pre-drill before nailing

Attach the joints together with rustic reproduction nails and carpenter's glue. Pre-drill because the nails will be so close to the edge that the board will split without a pilot hole.



Bevel and then apply glue to the edges of the bottom boards



Set the pieces in place



Weight them down until dry

Bottom Line

Measure the bottom opening and cut pieces to fit. **REMEMBER**, the outside edge of the bottom must have a 15-degree edge to match the sides. If you don't have a wide enough board to cover the whole bottom just cut 'slats' to fit, with a butt joint in the center. Glue them in place. Weight the bottom in position while the glue dries.



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Cut and position the feet



Glue 'em, then tape them in place until dry



Add nails through the bottom for strength

Make and install the feet. They are trapezoids 10" long with 15-degree angles at the sides. Cut a shallow arc with the jigsaw on the long side leaving a 2" foot on either end. Glue and nail the short side to the bottom of the basket.

Tip:

To avoid an emotional meltdown, use tape to hold the feet in place while nailing them.



Rip thin pieces for the handle



Flex your strip - if it breaks, it needs to be thinner

Make the handle by gluing two thin strips of wood together. (ripped off the side of a 2" x 4" board with your circular saw). If it's thin enough it will bend but not break.



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Glue and clamp one end



Gently bend the strip and clamp the other end



Apply glue to the outside of the first strip



Clamp second strip in place over the first one



Clamp them together every few inches

Clamp the first strip in place on the trug. Apply glue and then bend the second strip to follow the first using small clamps (or tape). Let the glue dry at least 20 minutes.

Tip:

The two strips will be different lengths so cut the inside one 1/2" or so shorter than the outside one. They can also be trimmed easily with a utility knife after they have dried.



Use decorative copper nails to secure the handle



Finished trug with compound angles and bent-wood handle

Pre-drill and install four little copper boat nails (available at [Lee Valley](http://LeeValley.com)) to anchor the handle. Sand all the edges smooth and apply a coat of milk paint. For an antiqued look, sand through the milk paint in spots.



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