TUTORIAL – Maple Leaf

## Techniques to speed up production

Purpose….

In this activity you will use **Polar Co-ordinates** and **Offset** to draw a Maple Leaf quickly and easily.

In the past you may have relied on **SNAP** and **GRID** to draw accurate drawings….

SNAP AND GRID SUCK – DON'T USE THEM – TURN THEM OFF

Snap only works if your lines fall on a snap location. Grid just gets in the way. Polar Co-Ordinates is one of the fastest ways to draw objects and will improve your drawing speed considerably.

Look at the drawing below. Note that many point locations can be found with horizontal and vertical lines offset the lengths shown. Eg: 36, 140, 60, 43, 33, 10, etc. etc. Any vertical or horizontal location can be found by offsetting lines.


MAPLE LEAF
SCALE 1:1
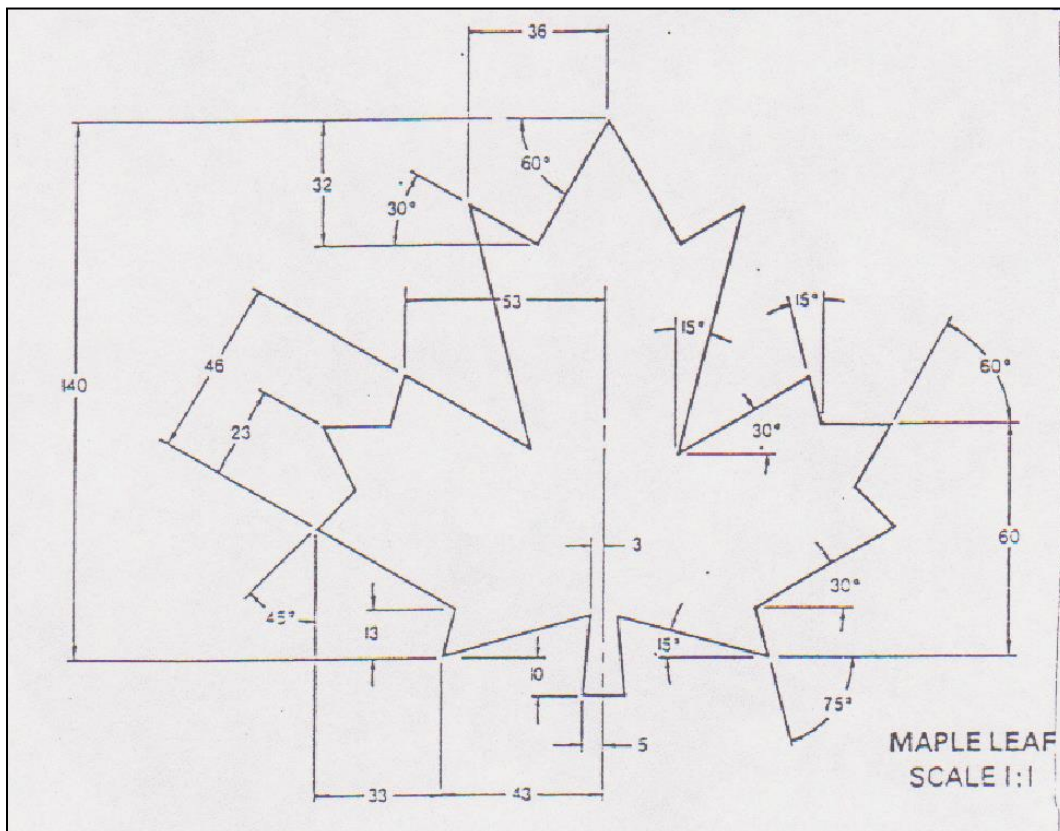
1. Did you turn **SNAP** and **GRID** <u>off</u> already? No? Sad Panda. Yes? Sunshine and Lollipops!
2. Open a NEW drawing in AutoCAD, type "L" (for line) and hit space (works like Enter) and left-click anywhere near the bottom center of your screen. It does not matter where.
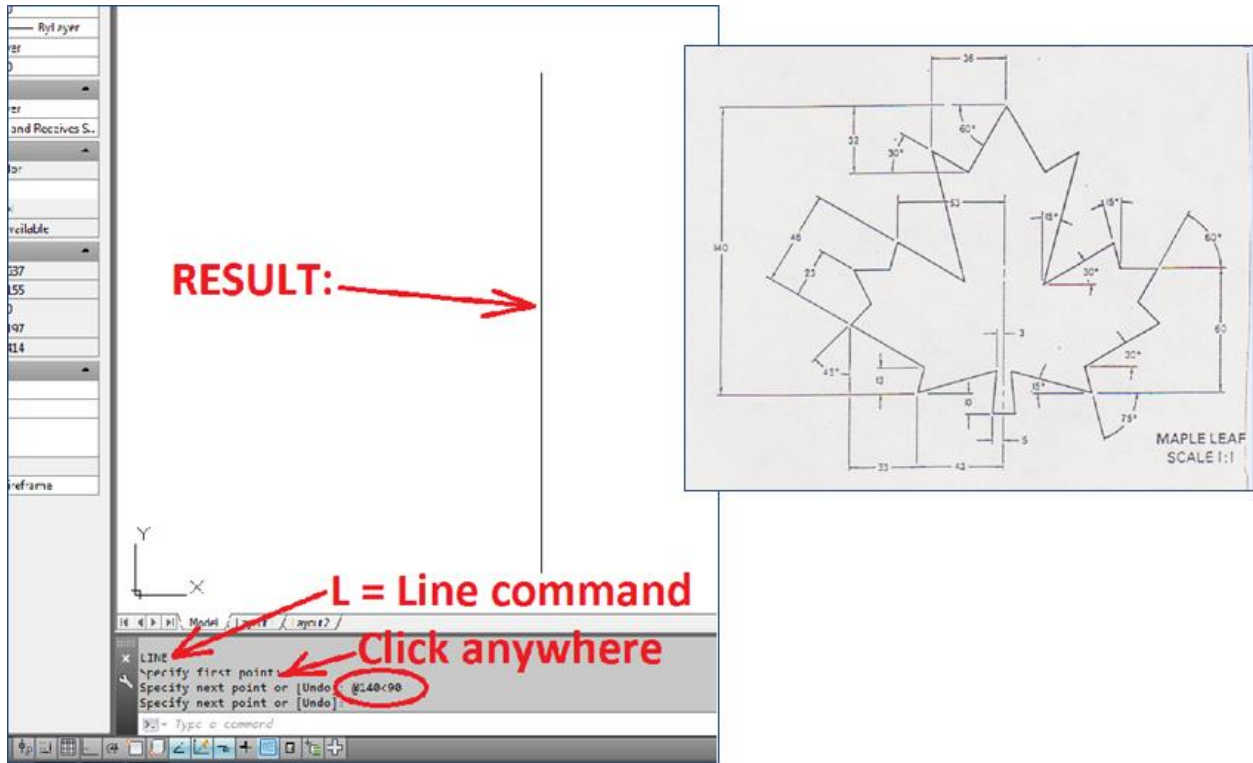

3. Get used to using the keyboard – it's faster. If you think the keyboard is slower, you'd be wrong.
4. Type "O" and hit space. This opens OFFSET. Offset the line you drew 36 to the left.
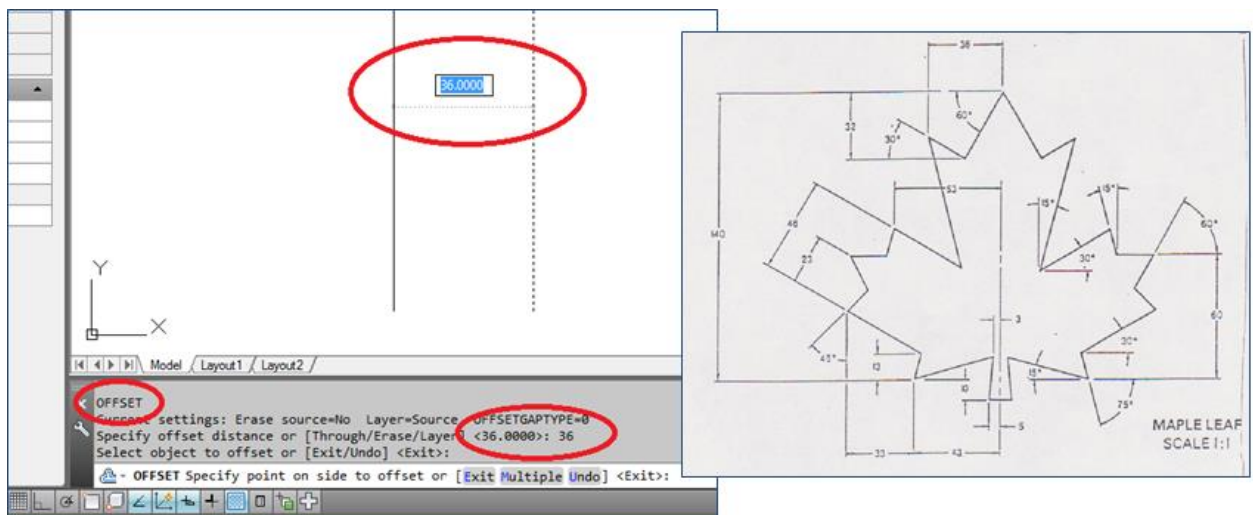
5. At this point, make sure **OSNAP** is turned on. **SNAP** and **OSNAP** are <u>not friends</u> – don't use them together. **SNAP SUCKS**, by the way.
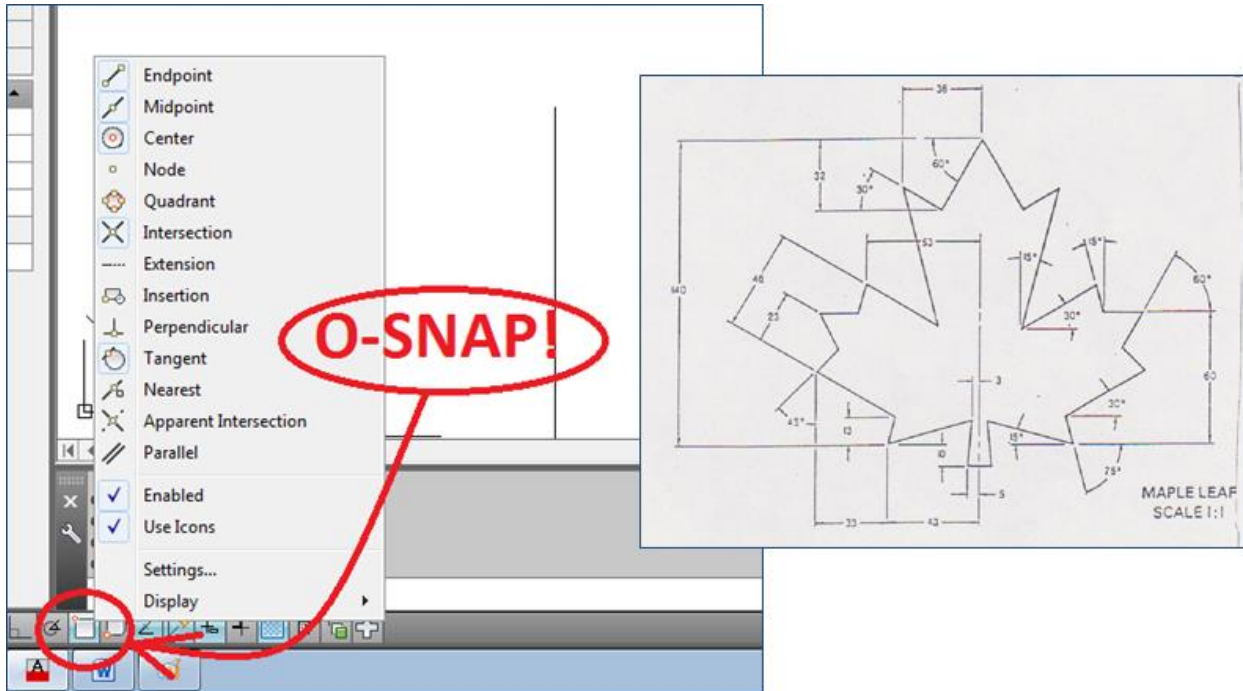

6. Type "**L**" and hit space, then hover over the top of the first of the two lines. You should see a green square appear. This is an **Object Snap** (or **O-Snap**), that wants to attach to the end of your line. Click there, and then type **@100<180**. Hit space (or enter) to <u>complete</u> the command, and then *again* to <u>close</u> the command. This draws a line exactly 100 long, and exactly to the LEFT. **O-SNAP IS AWESOME – SNAP SUCKS**.
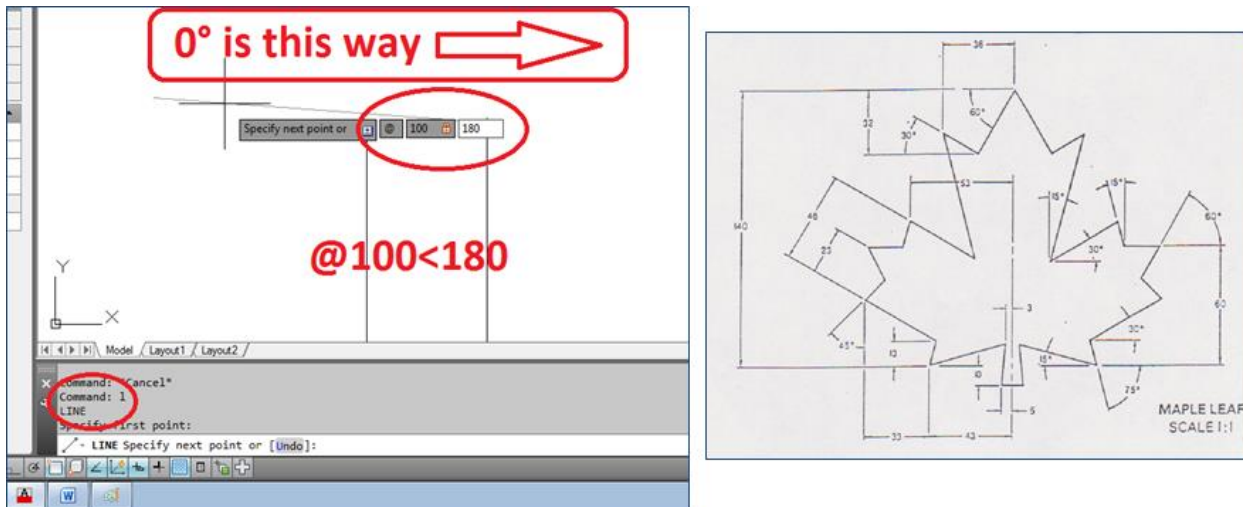

7. Now type "O" and hit space, and **OFFSET** that line **DOWN 32**
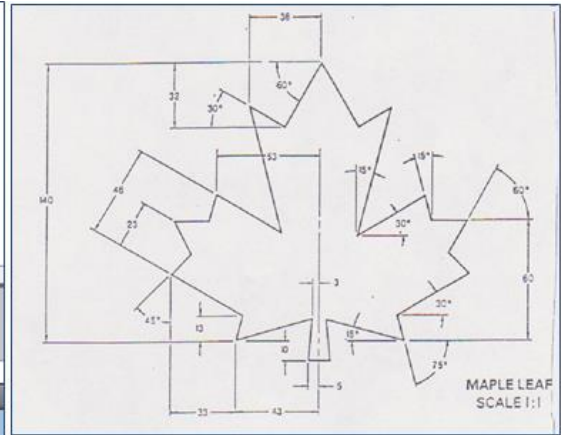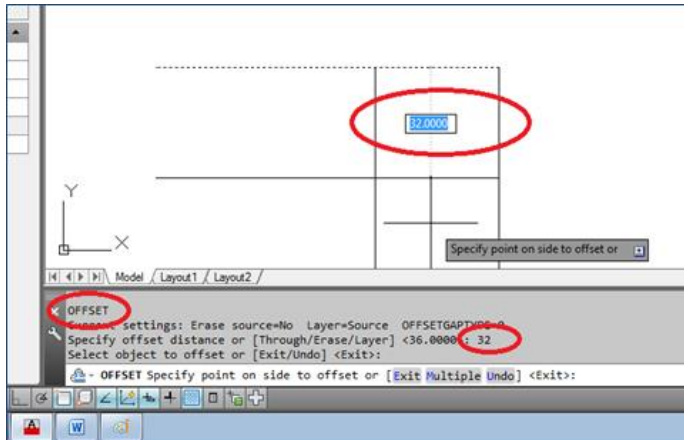
8. "L" and space, click the top right intersection of lines, and type @-40<60. Space again to stop, space again to end. This points us in the 60° angle direction, but we're going backwards. If that blows your mind, you can type a positive 40, but you'd have to figure out what the correct angle would be (180° + 60° and I don't have time for that).
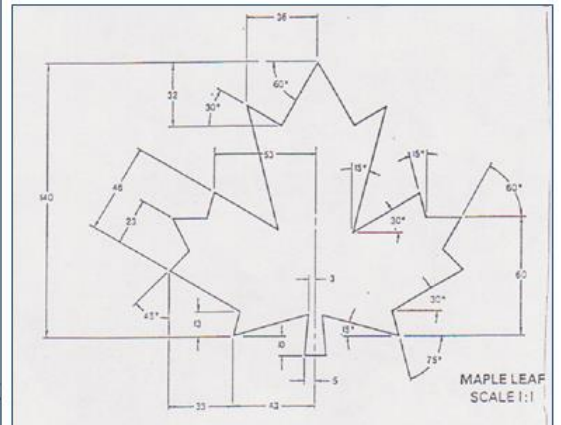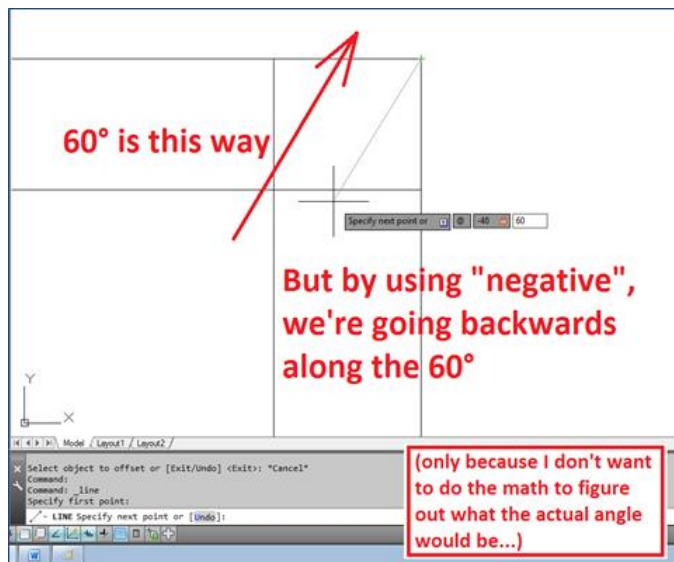

9. Hit **SPACE** again – it brings up our **LAST** command, which was **LINE**. See how much faster using the keyboard is? Still not convinced? Tsk. Pity. Click the intersection of the 60° angled line and the offset 32 line (a green "**X**" should appear, **OSNAP** telling you it wants the Intersection), and type **@30<150**. I did the math in my head this time, just for you. Hit **SPACE** to stop, and **SPACE** to end.
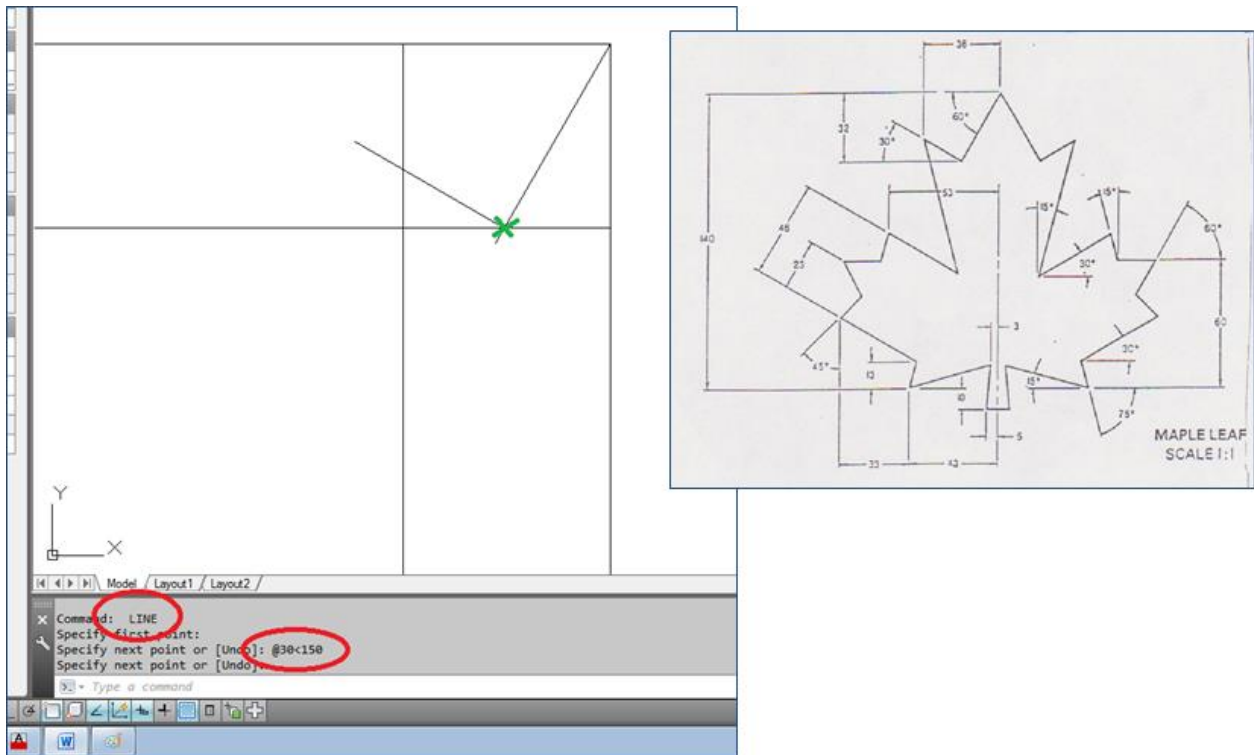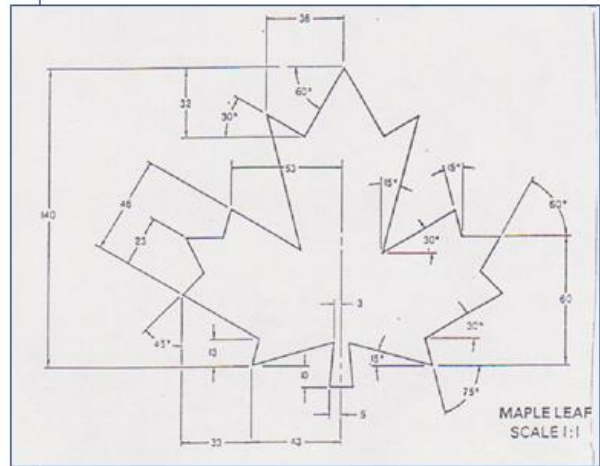
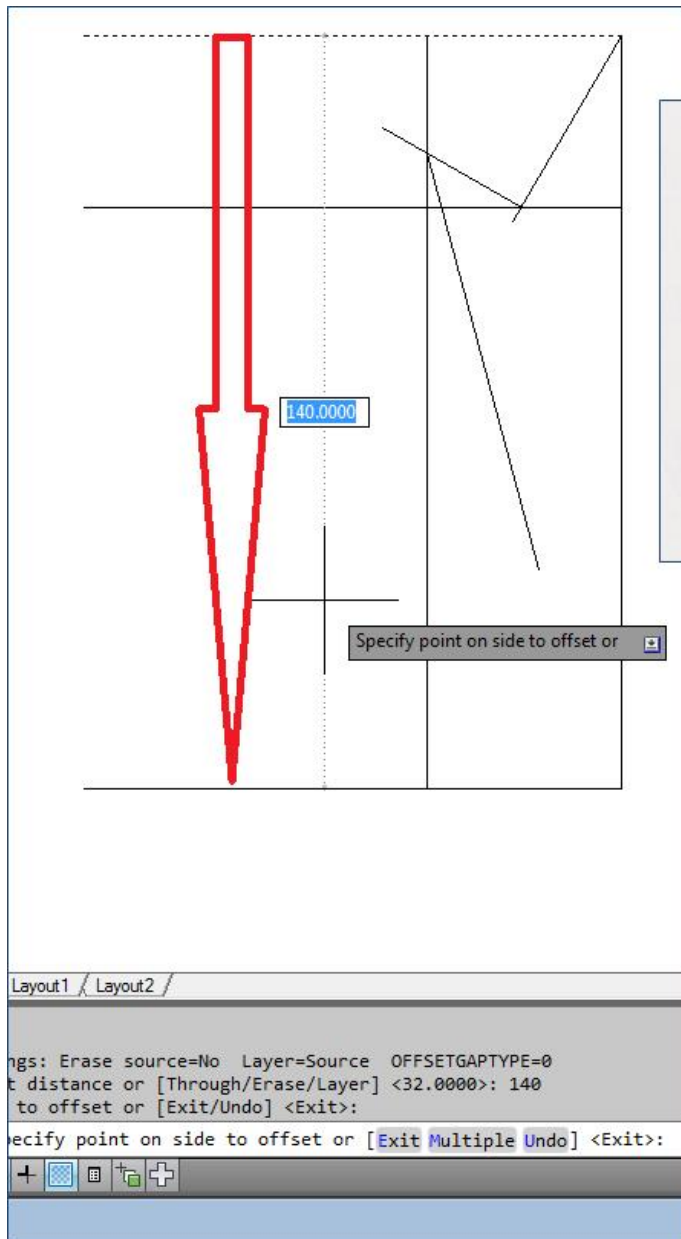10. Hit SPACE to bring up LINE again (fast, eh?), and click the intersection of the 150° line we just drew, then type @80<285. Space and Space. Angles are important. You remember from the notes, which direction is which, correct?
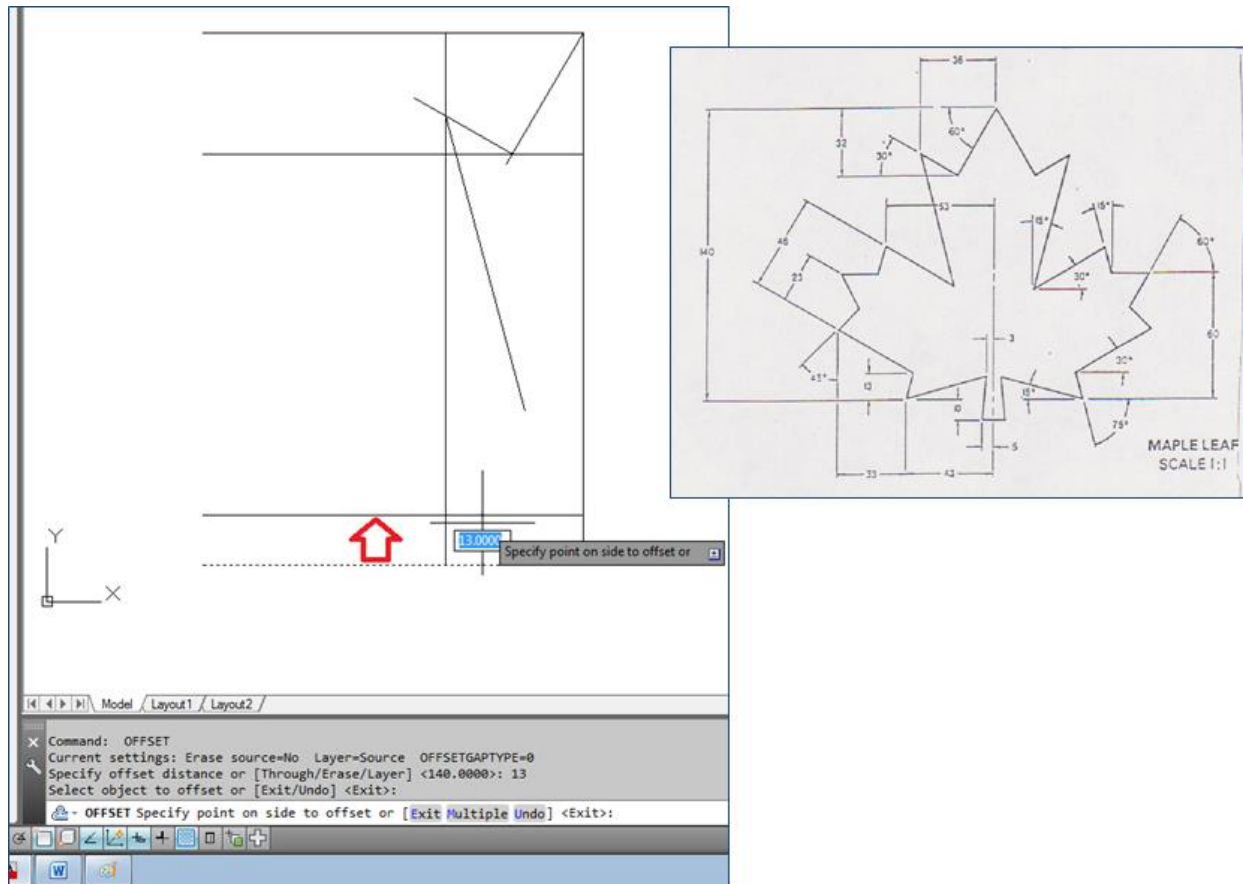

270° + 15° = 285°
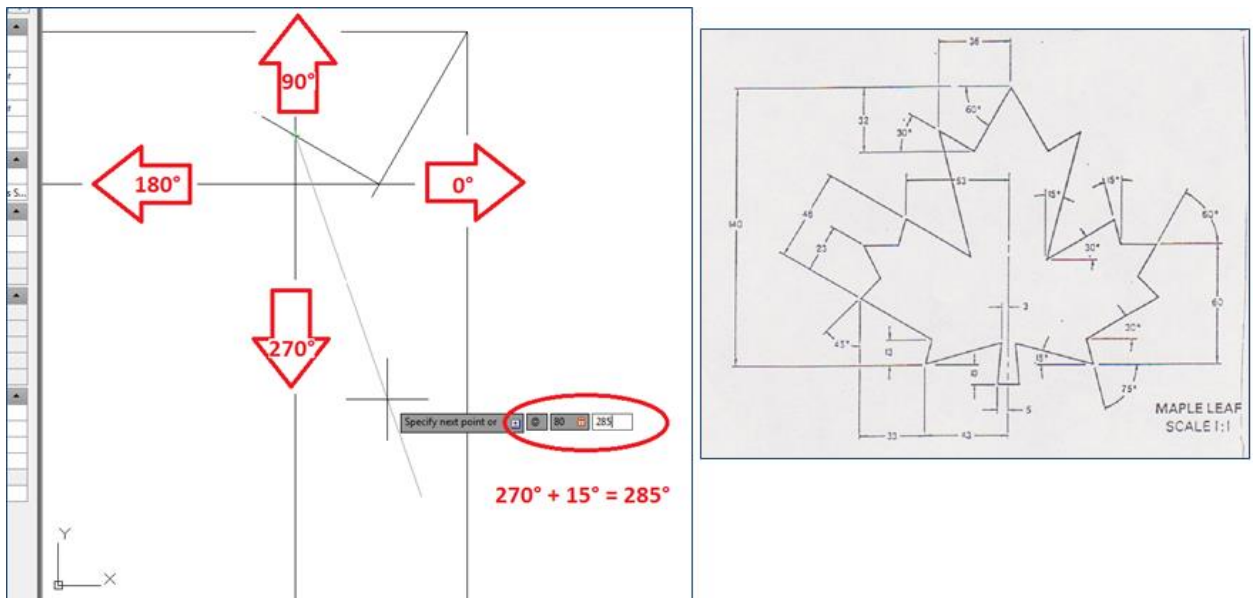
11. Now let's have a look and see how far we have gotten.
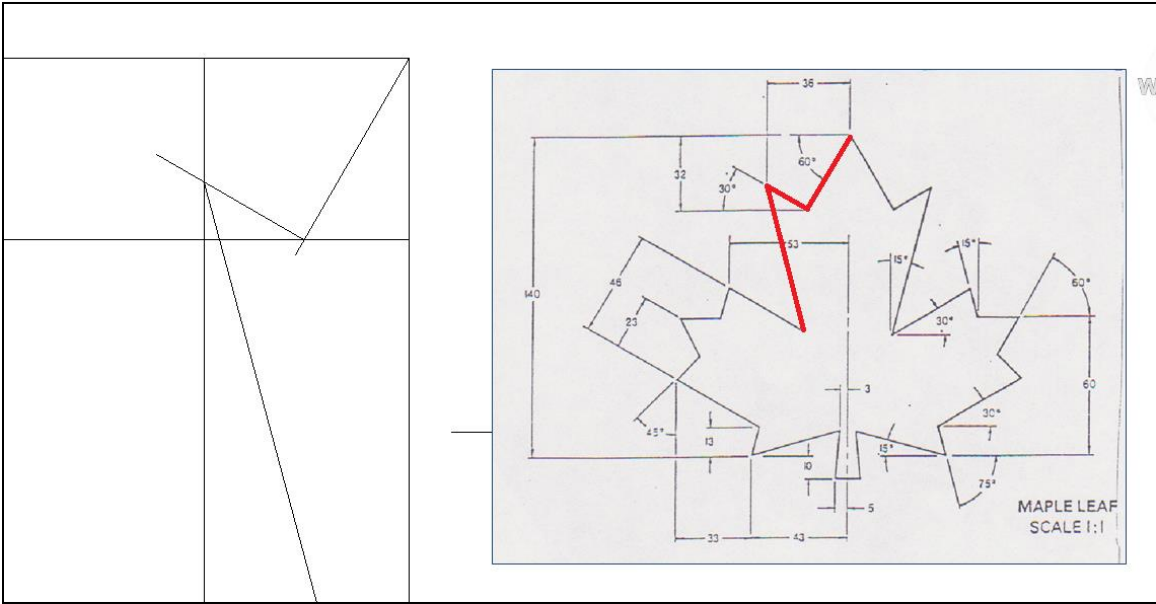
12. Let's take that top horizontal line, and offset it 140 down. Do I really need to tell you what to type for each step?

MAPLE LEAF
SCALE 1:1

140.0000

Specify point on side to offset or

Layout1 / Layout2 /

ngs: Erase source=No Layer=Source OFFSETGAPTYPE=0
t distance or [Through/Erase/Layer] <32.0000>: 140
 to offset or [Exit/Undo] <Exit>:

ecify point on side to offset or [Exit Multiple Undo] <Exit>:

13. Now, offset that line UP 13

MAPLE LEAF
SCALE 1:1

```
Command: OFFSET
Current settings: Erase source=No  Layer=Source  OFFSETGAPTYPE=0
Specify offset distance or [Through/Erase/Layer] <140.0000>: 13
Select object to offset or [Exit/Undo] <Exit>:
OFFSET Specify point on side to offset or [Exit Multiple Undo] <Exit>:
```
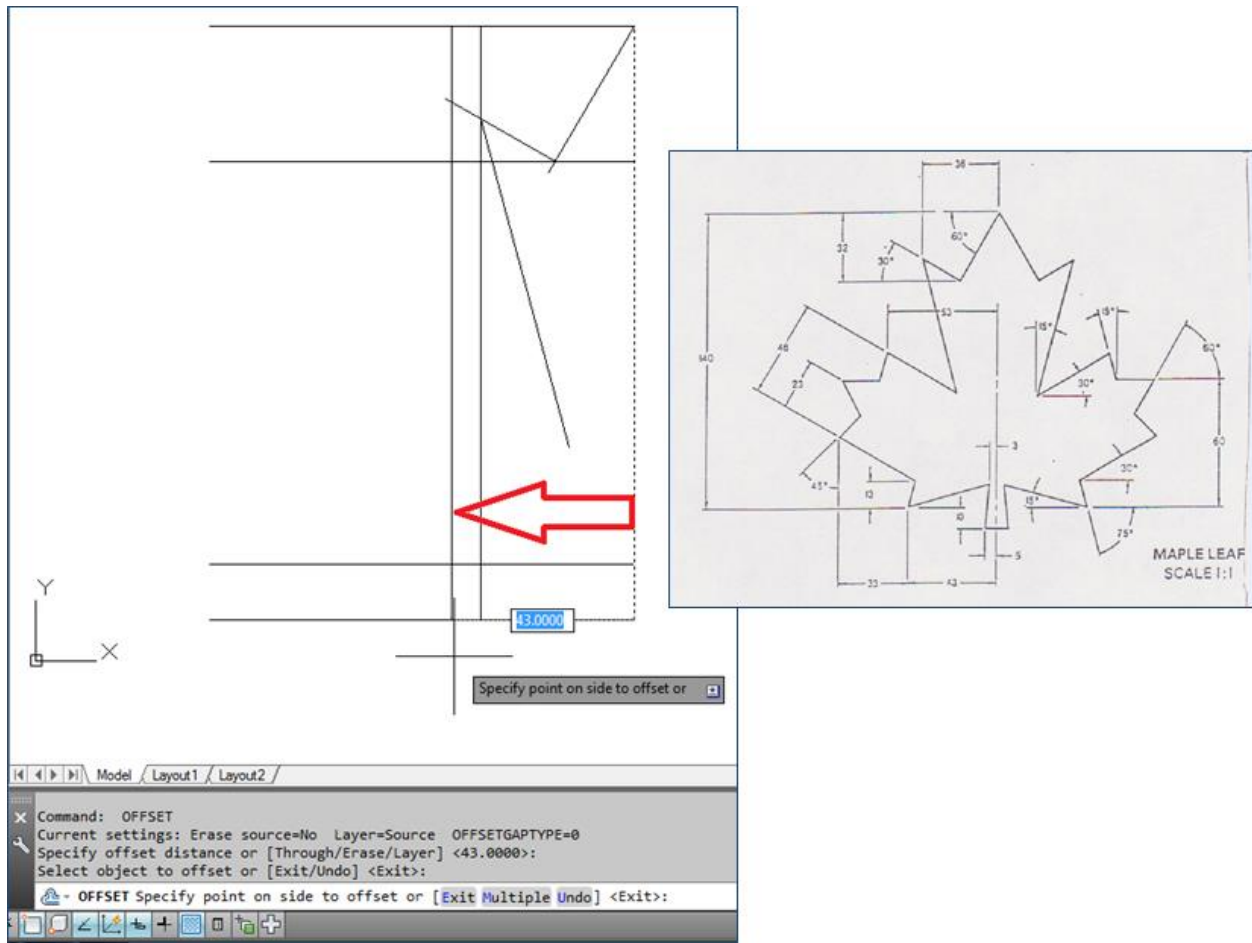
14. Now **OFFSET** the original vertical line **43** to the left. You did just hit **SPACE** to call **OFFSET** back up again, right? Or did you type it out by hand? Or search for it with the mouse? I'm telling you, there is a faster way here….
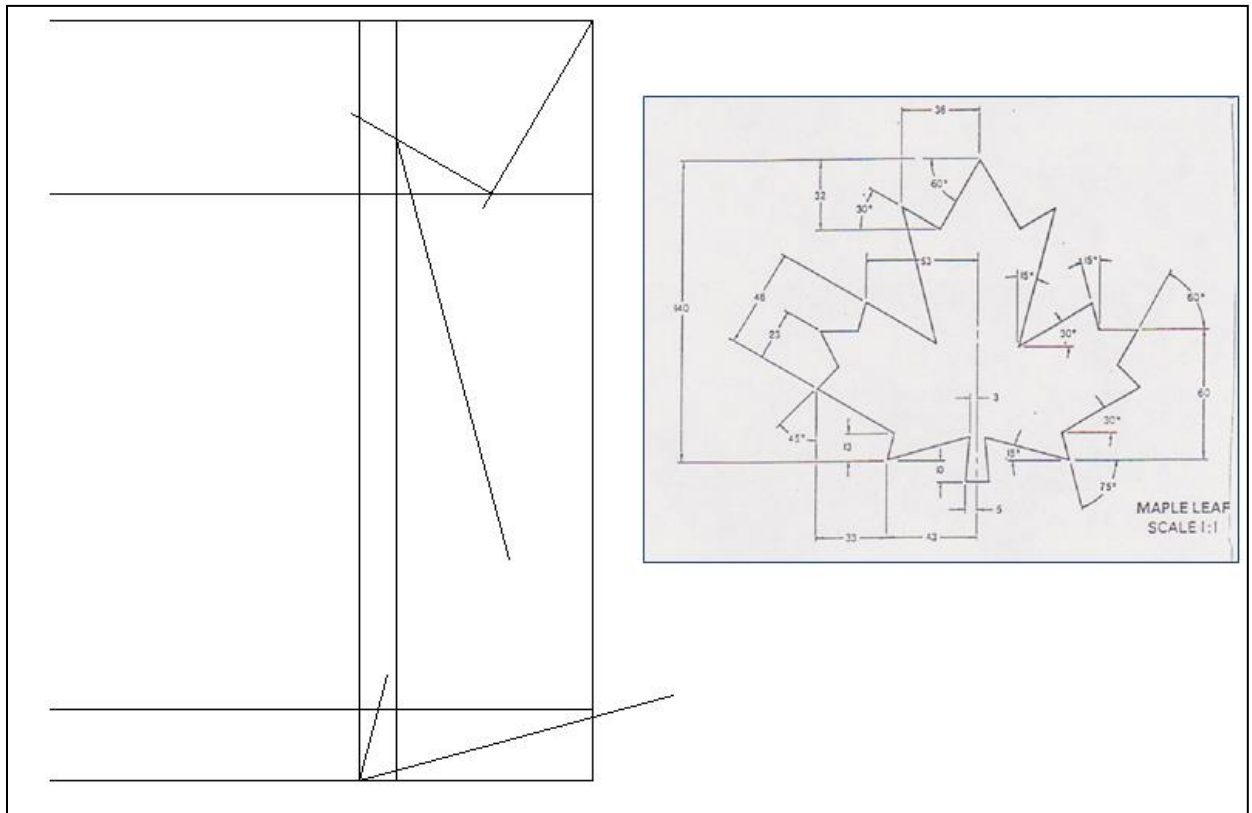
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SCALE 1:1

15. Now draw a **LINE** from the intersection of the bottom line and the 43 line, a distance of **60** and at an angle of **15°** (you did type **@60<15**, correct?)
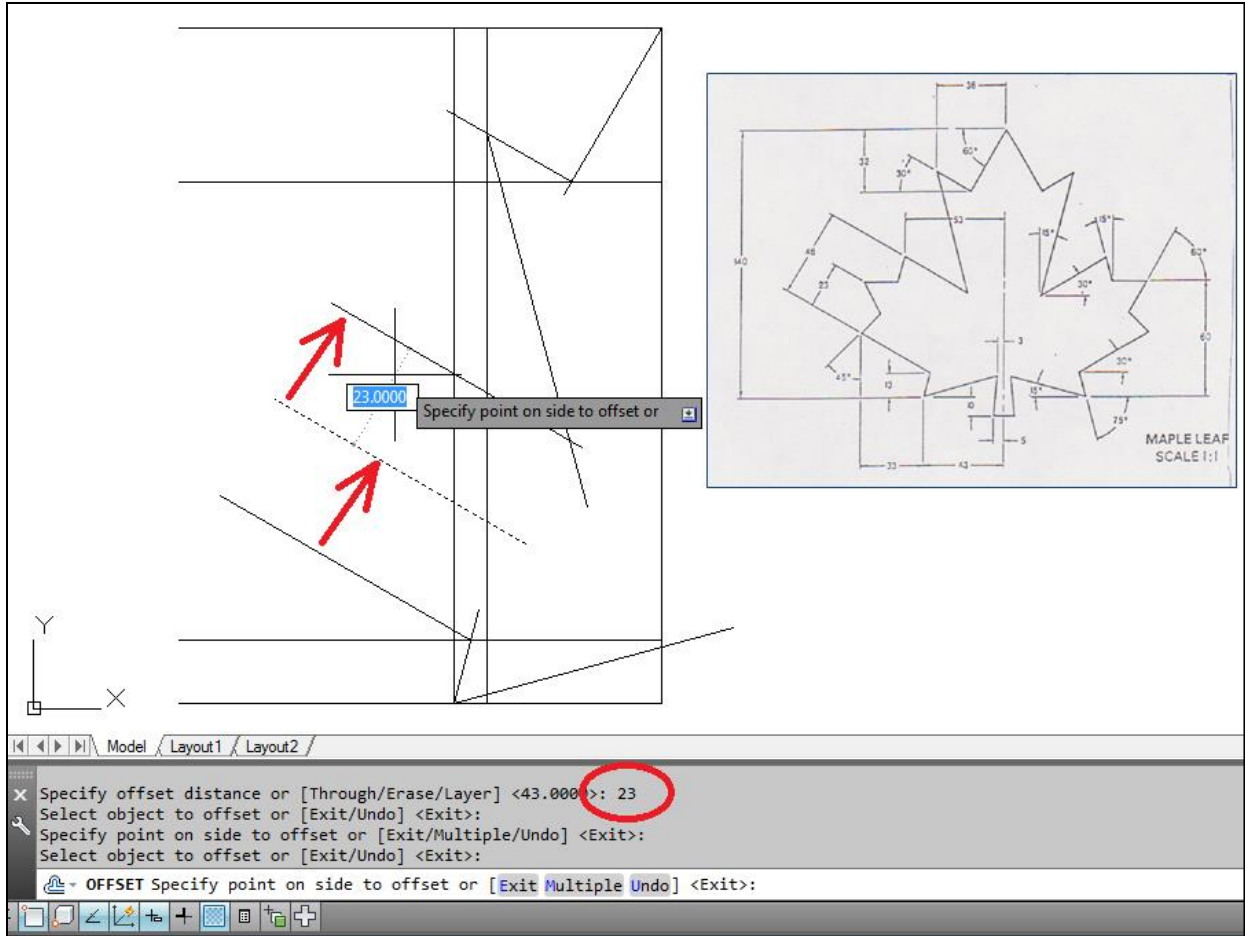
Specify next point or ☐ @ 60 🔒 15
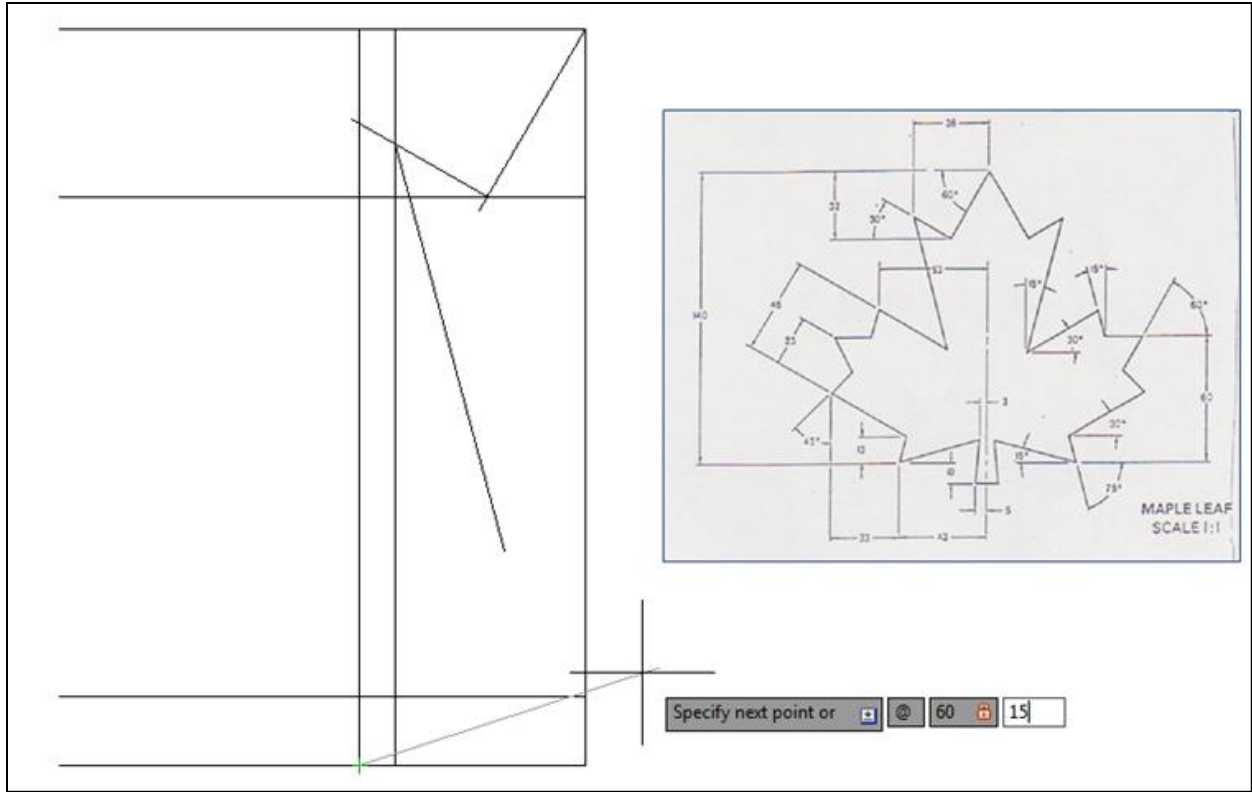
16. Now draw another **LINE** from the same point, but this time **@20<75**
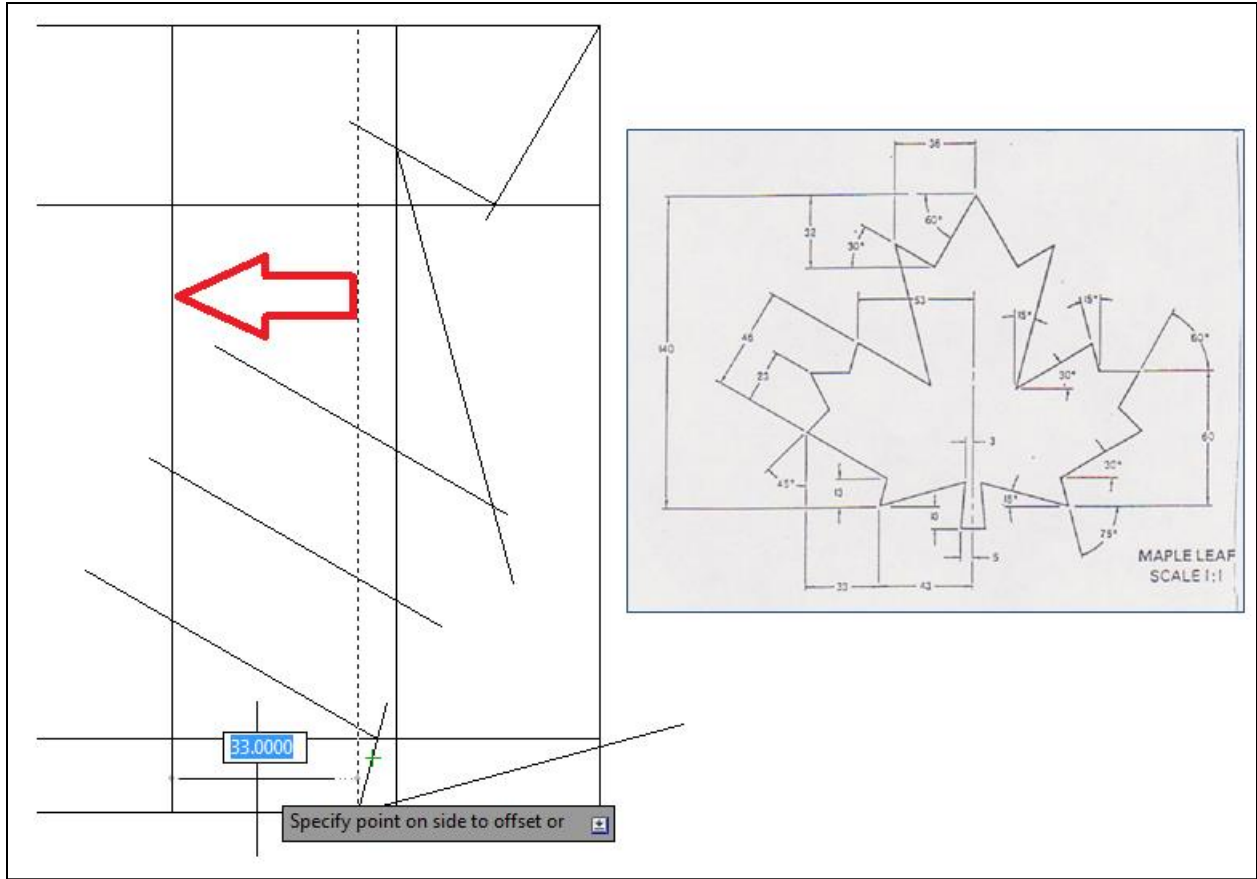
17. Let's draw the angled bottom of the left side of the leaf. Draw a **LINE** at the intersection we just created, a distance of **60**, angled **150°** (that's 180° − 30° from the drawing), or **@60<150**
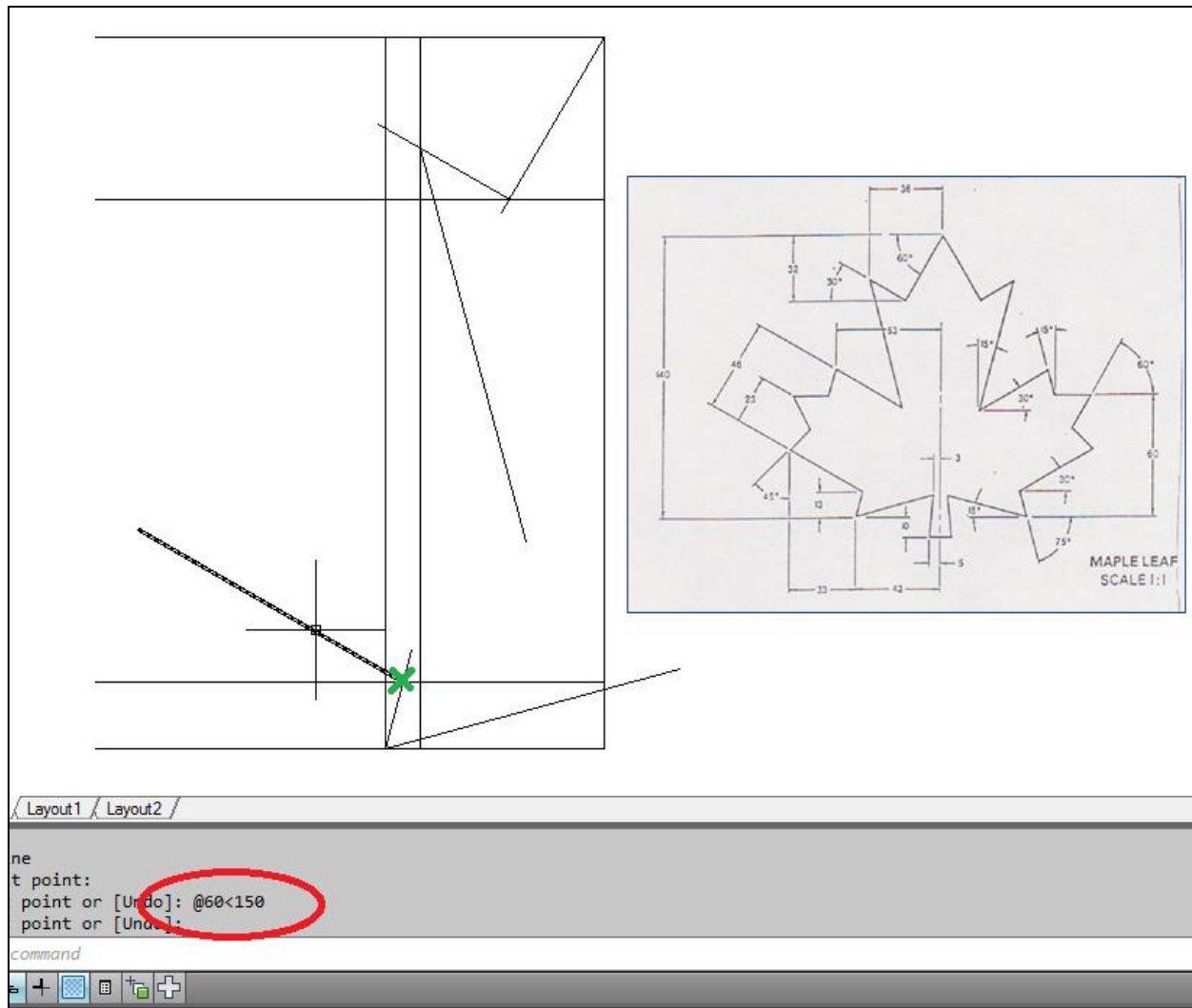

18. Now **OFFSET** that line upwards **23**, and then **OFFSET** the new line **23** as well. Tell me you typed "**O**"?!

```
Specify offset distance or [Through/Erase/Layer] <43.000>: 23
Select object to offset or [Exit/Undo] <Exit>:
Specify point on side to offset or [Exit/Multiple/Undo] <Exit>:
Select object to offset or [Exit/Undo] <Exit>:
OFFSET Specify point on side to offset or [Exit Multiple Undo] <Exit>:
```

19. OFFSET the Vertical line we have on the far left another 33.

33.0000

Specify point on side to offset or

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20. FROM the intersection of this new line and the lower of the three angles lines, draw a **LINE @25<45**

Specify next point or | @ | 25 | 45
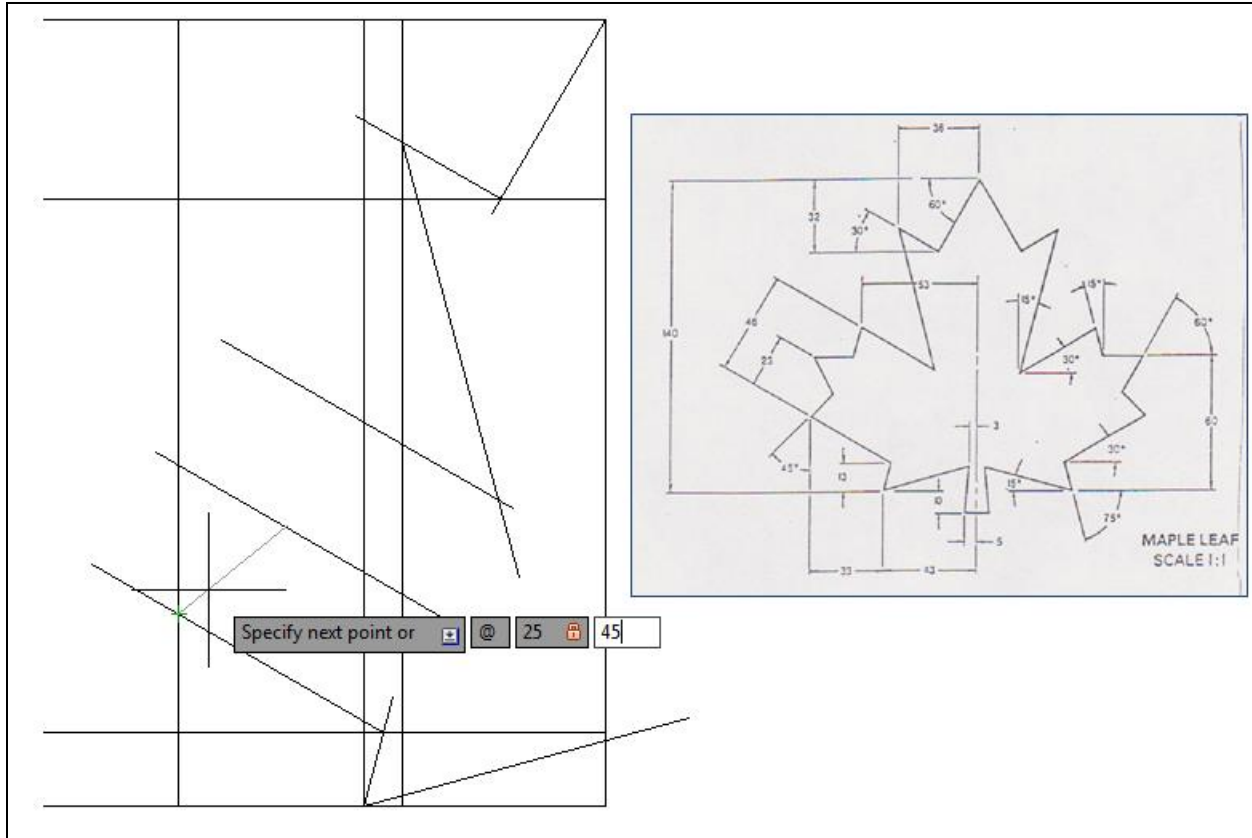
21. Now **MIRROR** that line, using the **ENDPOINTS** of the angled **MIDDLE** line (Say it with me: **OSNAP is AWESOME**)

Move   Rotate   Trim

Copy   Mirror   Fillet

Stretch   Scale   Array

Unsaved Layer State

Text   Diameter   Leader   Create   Insert   Edit

Modify

[−][Top][2D Wireframe]

Layer

Layer

ceives S...

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Endpoint

Mirror this
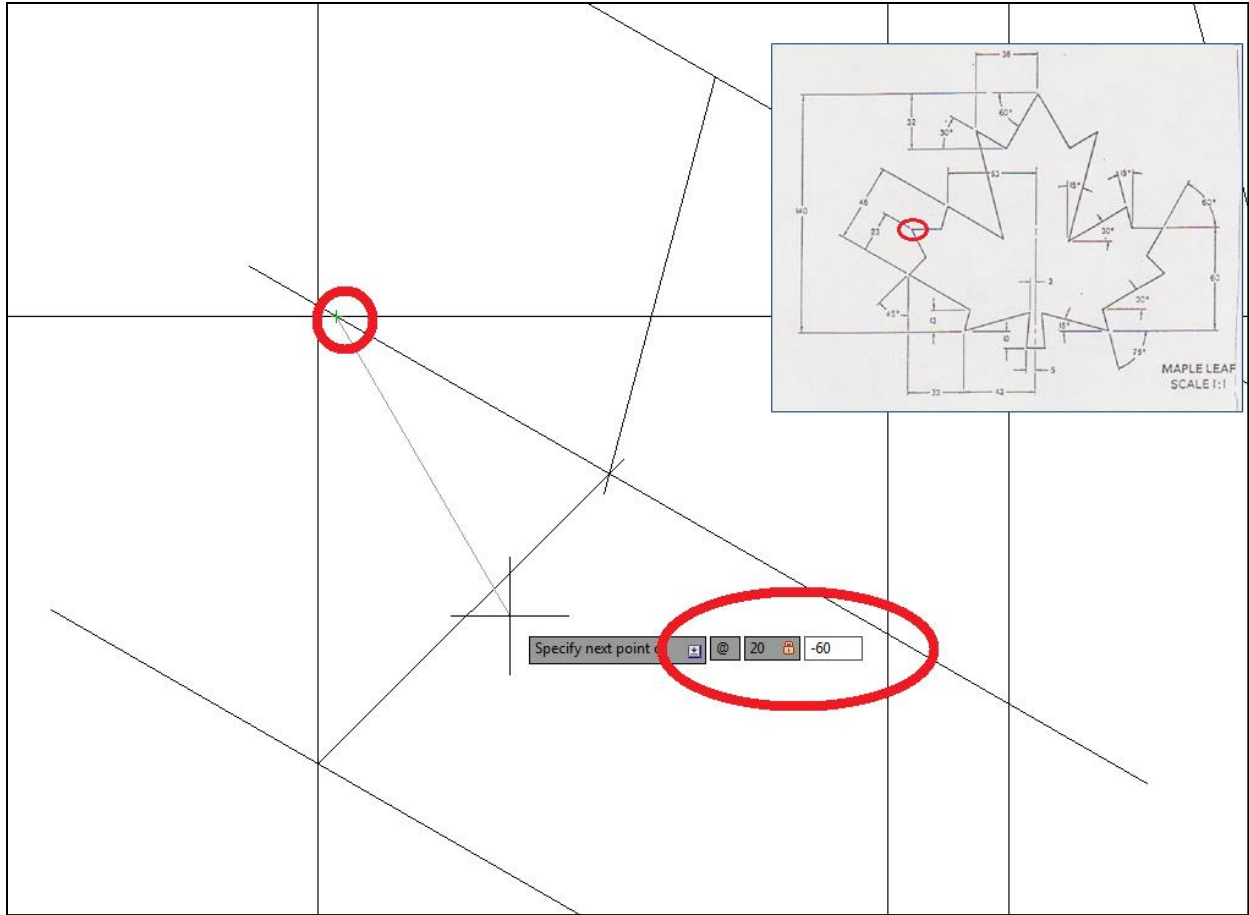
Around this

and it ends up here
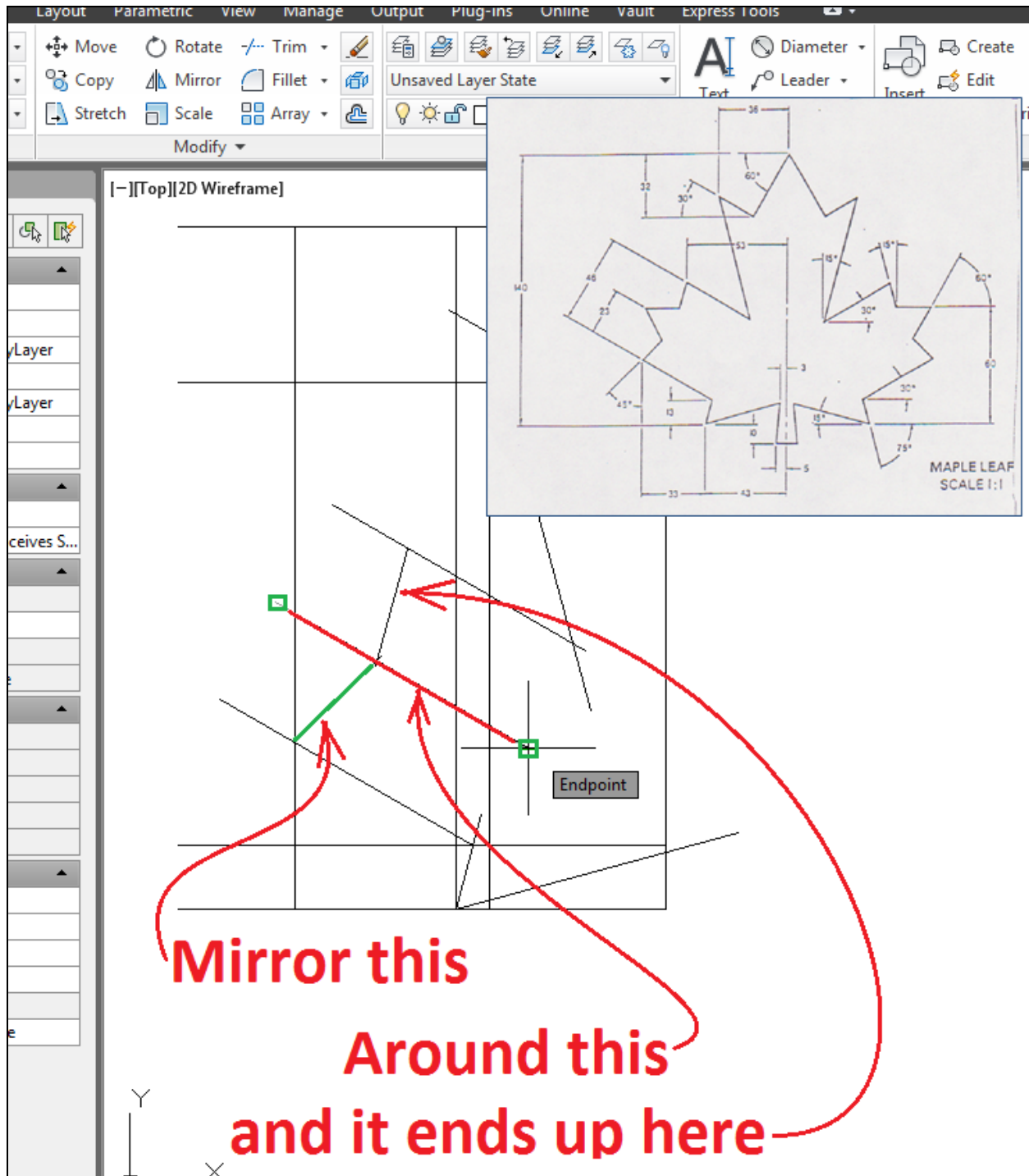
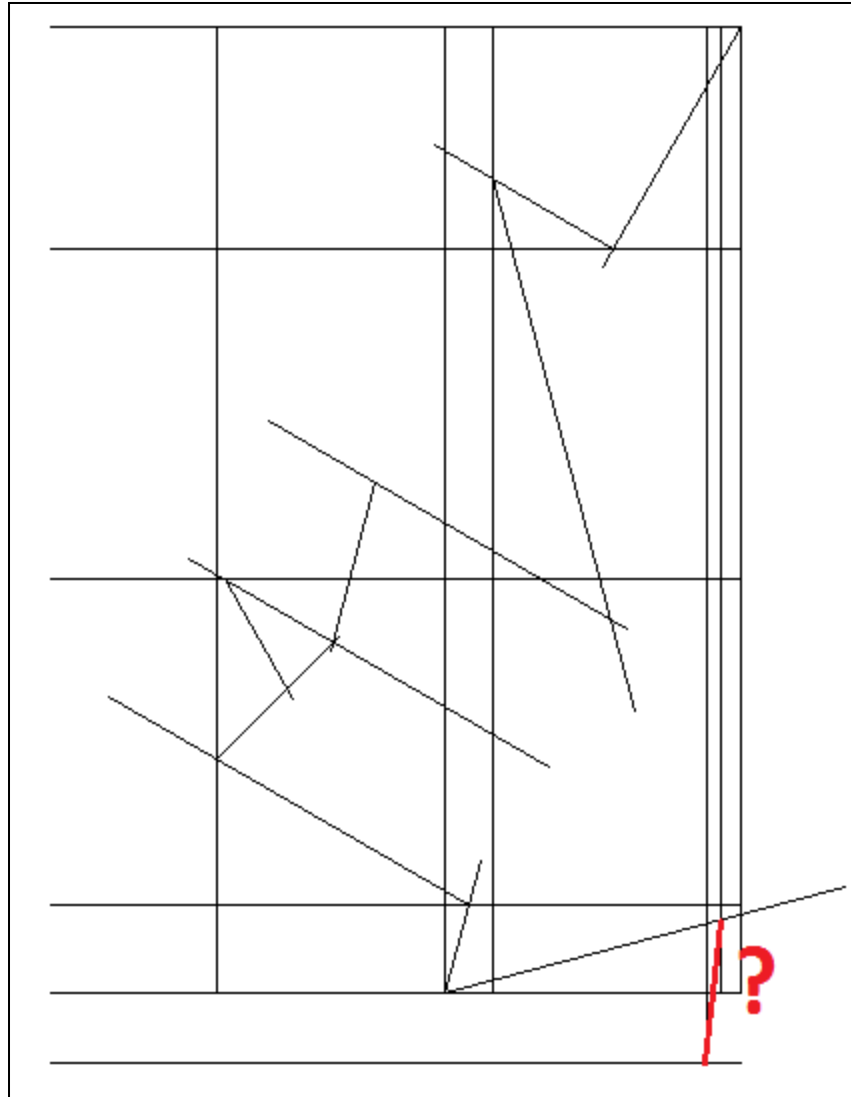22. Now **OFFSET** the bottom horizontal line UP **60**
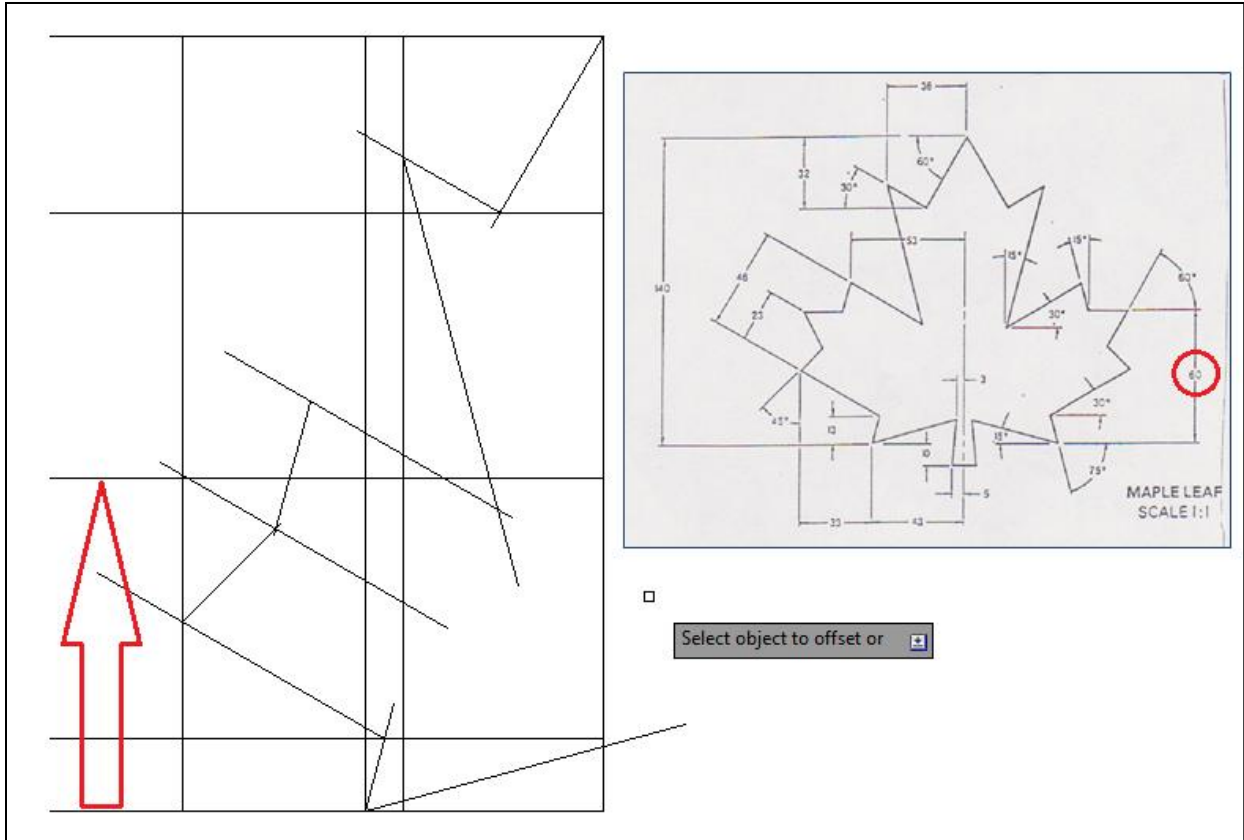
23. Use the WHEEL of your mouse to ZOOM IN, and then we're going to draw a line from the center tip @20<-60 (this means the line will go 60° down (counter-clockwise) from the 0° line)
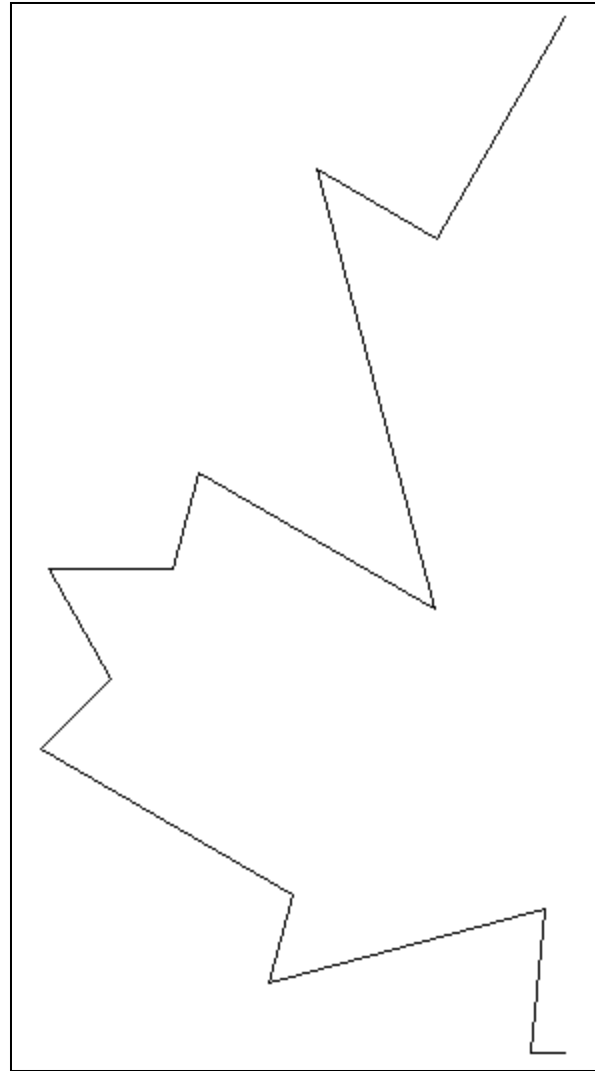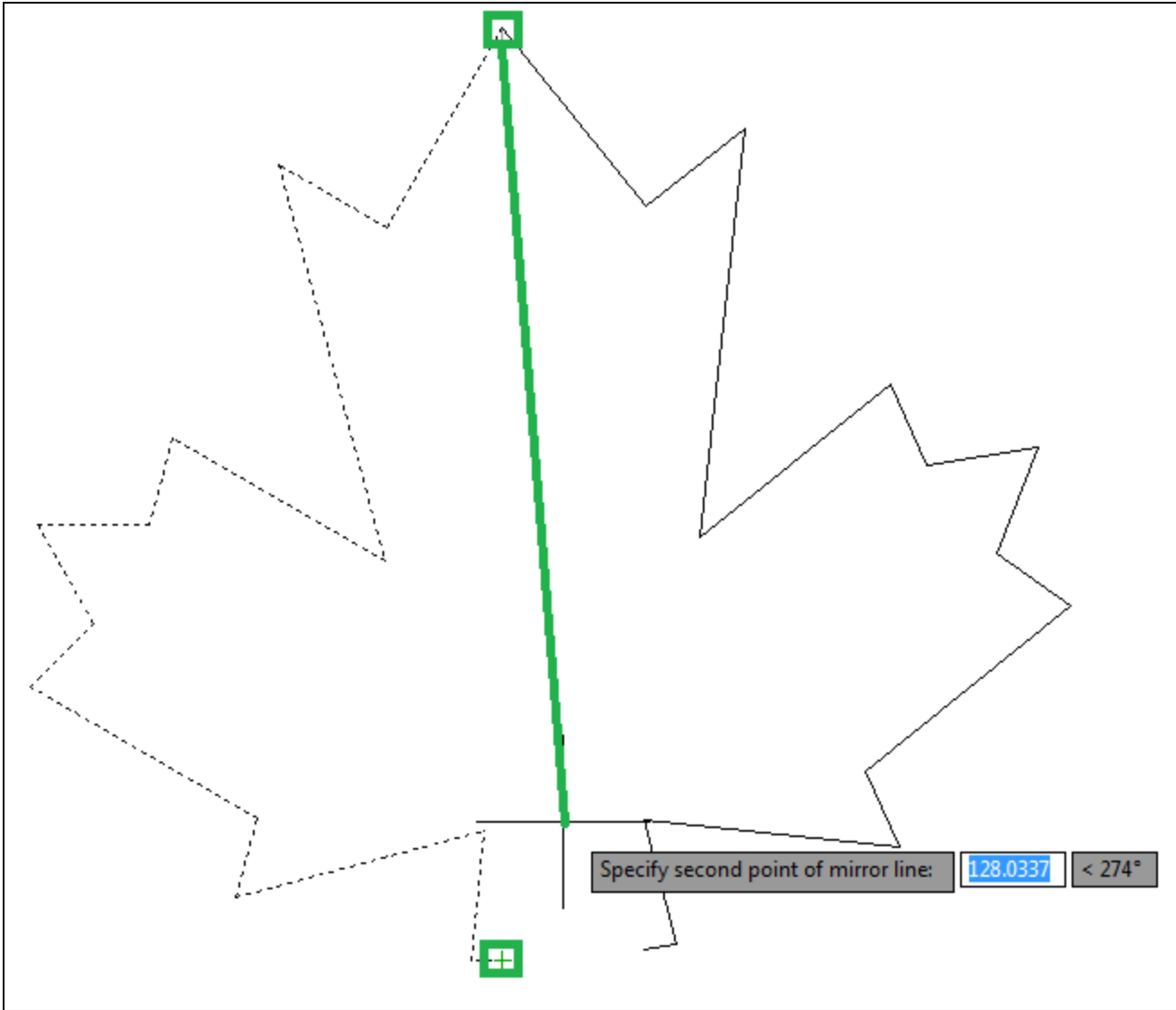
24. Now, based on what you have already worked through, how are you going to do the stem on the leaf??

25. Now, TRIM or FILLET or ERASE anything that does not look like leaf. FILLET is one of my favourites, because it trims and/or extends.

26. Now MIRROR the half leaf, using the END POINTS of the TOP and BOTTOM, and you're done!

Specify second point of mirror line: 128.0337 | < 274°

27. Ta-da!

28. Show your instructor your awesome Maple Leaf!