# Kaleidoscopes and mirroring

After the last FCDCC meeting, I just had to play around with making mirror images and kaleidoscopes. In the process, I found some interesting resources on the web to help in creating these kind of images. If you don’t have time to deep dive into some of the procedures, maybe some of these resources might help. This document contains some tips and links to resources that I found useful. I’ve also included some actions that I made to make mirroring a little easier; the actions include mirroring left, right, up and down. I created some templates and included them here; one of them is an 8 segment template as Jeannie demonstrated, and the other is a 16 segment template that follows along similar lines. And finally, there is an example of a 16 segment kaleidoscope using the 16 segment template.

Rich

### Mirroring

I created a series of actions to create a mirrored image. The actions are destructive, so always work on a new copy of the image. To use, simply create a crop of the image (be sure to delete the cropped pixels) you would like to mirror and run one of the four actions. The four actions are to mirror left, right, up and down. The actions can even be combined, for example, run one of the horizontal mirrors, then run one of the vertical mirror actions. There are some instructions included with the actions.

Here are the instructions from the mirror actions:

Mirror Actions

There are four mirror directions, and they can be combined to create compound mirrors. To use these effectively, here are some tips:

1) Be sure to duplicate the image because this process is destructive.

2) Using the 'Crop' tool, cut out a section of the image that will be mirrored.

Tip: Select the 'Ratio' from the dropdown so you can independently scale height and width.

Tip: Rotate the image to get even more creative crops.

Tip: Be sure that the 'Delete Cropped Pixels' check box is checked.

3) Hit the enter key, or hit the check mark in the header bar to accept the crop.

4) Run any of the actions to mirror either up, down, left or right.

5) (Optional) After creating a horizontal mirror (either left of right), flatten the image and run the vertical mirror (either up or down).

Tip: Be sure to flatten the image before running the second action.

6) When running the action there may be a warning when it tries to align the image to the side. This is caused with an improper alignment setting. With pen tool selected, click on the align button in the top bar and be sure to select 'Align To' drop down to ‘canvas’.

### Kaleidoscopes

To create a Kaleidoscope, you need to create a wedge that will be replicated and placed multiple times to fill the page. Some helpful tips for creating wedges deal with creating triangles.

A good video regarding triangles is:

[Perfect triangles in Photoshop - YouTube](https://www.youtube.com/watch?v=NA_4rbQ6SA0)

To make the calculation of the angles and lengths easier, use this online trig calculator:

[Right Triangle Calculator | Find a, b, c, and Angle (omnicalculator.com)](https://www.omnicalculator.com/math/right-triangle-side-angle)

An example of how you might use this would be first create a new document with transparent background, for example, 1000x1000 pixels. Divide 360 by the number of segments to get the interior angle of each segment. The height of the segment would be half the length/width of the document less some small amount to allow for some curvature of the outside leg of the triangle. Be sure to create the curvature as you are creating the shape since once the shape is placed and you move on to the next steps, the shape is rendered into pixels and is no longer editable with the pen tool. However you can save the path by giving it a name, and the path will still be editable and you can recreate the wedges.

As an example, suppose you wanted an 12 segment Kaleidoscope. Divide 360 by 12, or 360/12=30.

To create the curve in the outside leg of the triangle, use the Bezier handle. When you create the handles, PS will create two, one forward and one backward; you only need one of the handles and not both. Deleting one of the handles is totally confusing, until I found this explanation on the web:

*First of all, to do this, you must select the****Convert Point tool****from the TOOLBAR (you CANNOT do this by pressing ALT/OPTION while using the pen tool)!*

# *To create a corner point with just ONE LEADING HANDLE:*

* *Convert the anchor point to a corner point with zero handles (if not one already), by clicking the point once with the****Convert Point tool****.*
* *Next, click and drag with the****Convert Point tool****while pressing ALT/OPTION.*

[*Video example*](https://youtu.be/L283DNLccAw?t=14)

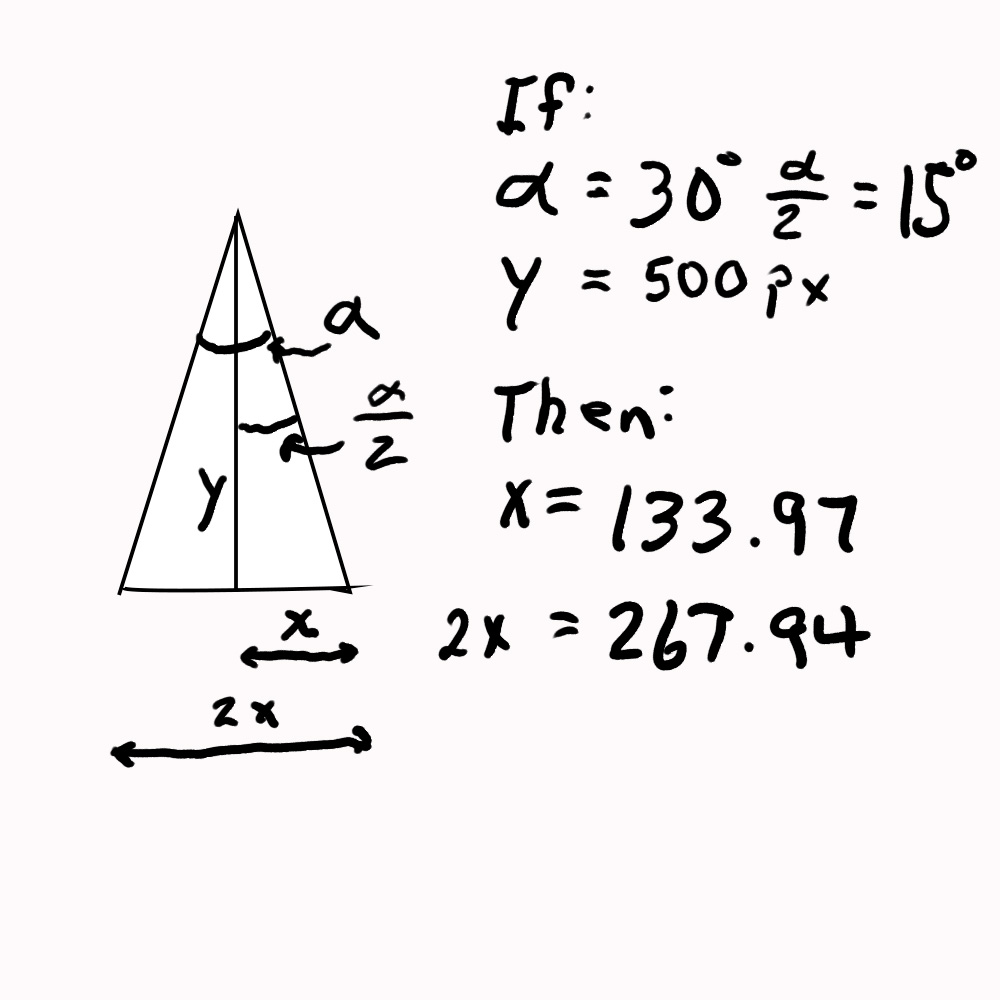
# *To create a corner point with just ONE TRAILING HANDLE:*

* *Convert the anchor point to a smooth point with two handles (if not one already), by clicking and dragging on the point with the****Convert Point tool****.*
* *Next, click once on the point with the****Convert Point tool****while pressing ALT/OPTION.*

[*Video example*](https://youtu.be/L283DNLccAw?t=23)

### Example

As an example, suppose you wanted a 12 segment Kaleidoscope. Divide 360 by 12, or 360/12=30. Using the shape tool, you can create an isosceles triangle wedge by using the triangle shape tool and supplying the height (y) and base (2x). Use the right triangle calculator to determine the half base (x) for a given height and angle (ɑ/2). Refer to this figure:



In this example, if you want an interior angle of ɑ=30 degrees and 500 px height, calculate the base of a right triangle (x) that has an angle of ɑ/2=30/2=15 degrees and height of 500 px. Then double it for the base of isoceles triangle (2x). You now have the info to create the triangle wedge. Before finalizing the shape, if desired, create a slight curve in the base leg so the resulting kaleidoscope is circular; this means that you want the height of the triangle to be slightly shorter to account for the bulge. You can optionally save the path by naming it; this may come in handy if you need to make any slight changes. Now place the shape on the layer and convert to smart object and continue as Jeannie demonstrated.