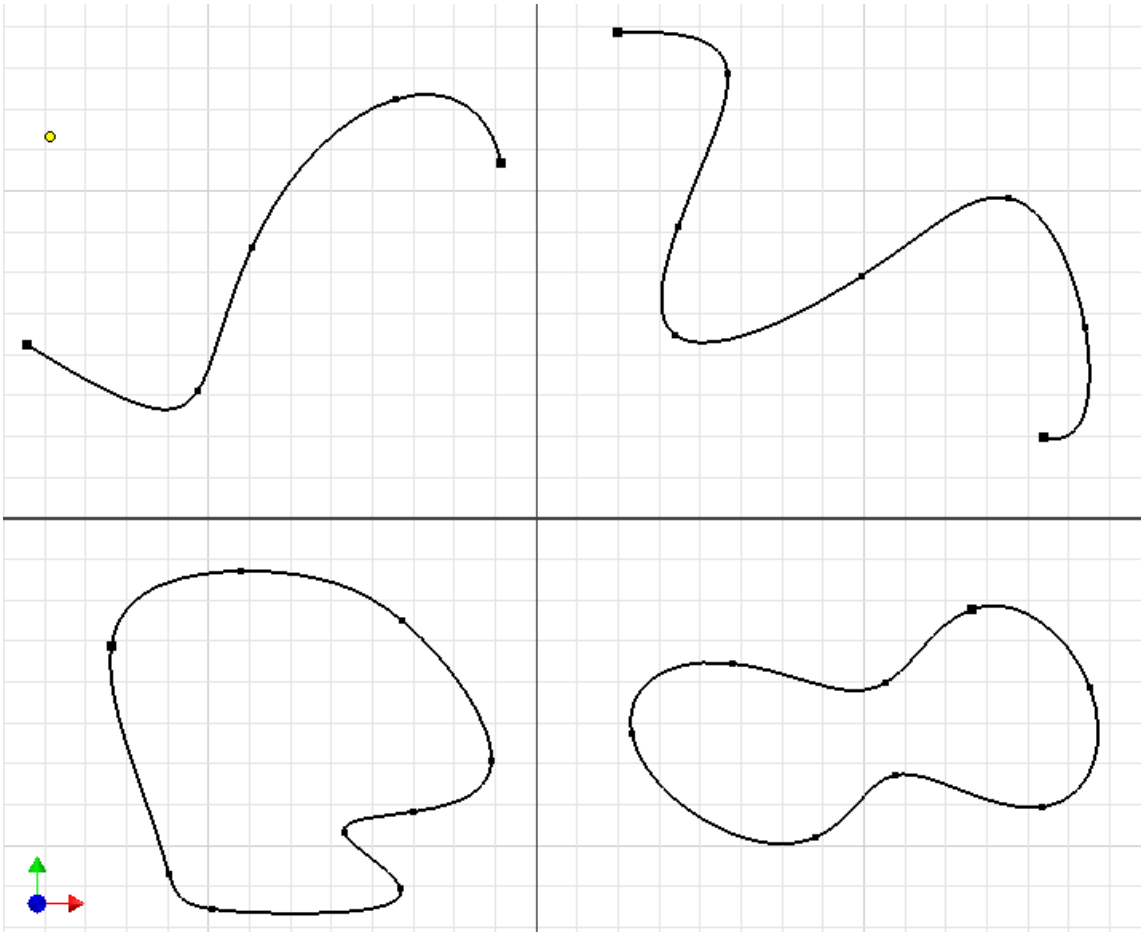
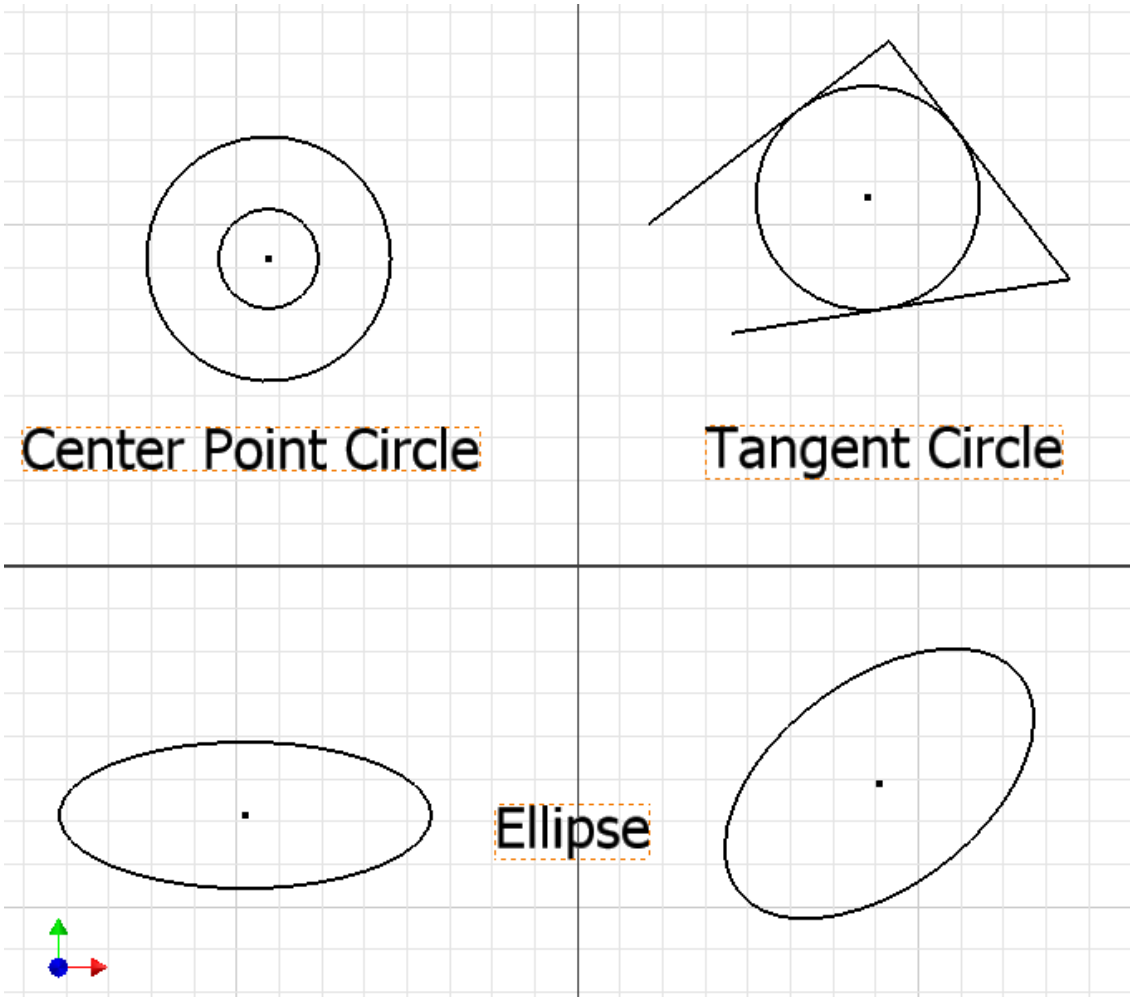
Activity 2.1.3 – Making Sketches in CAD

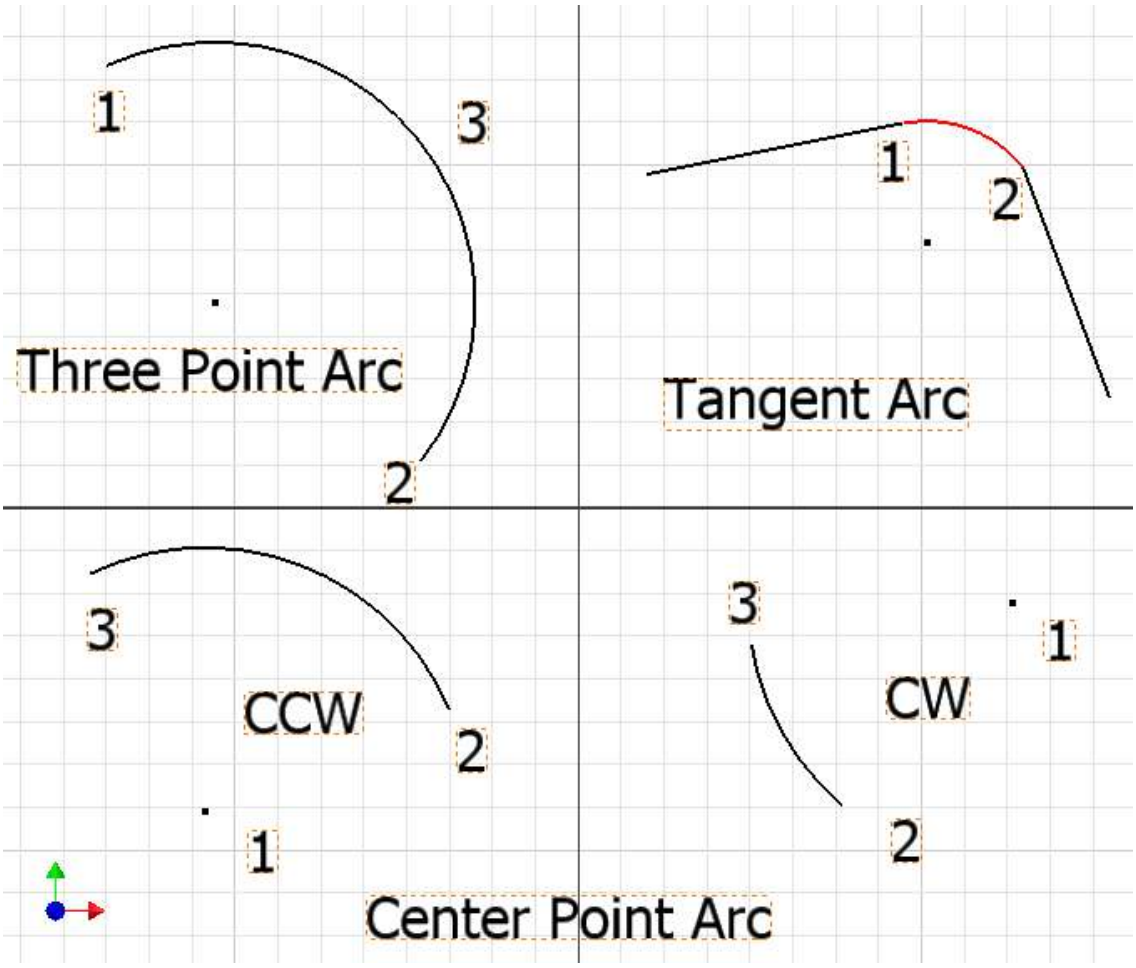
Procedure



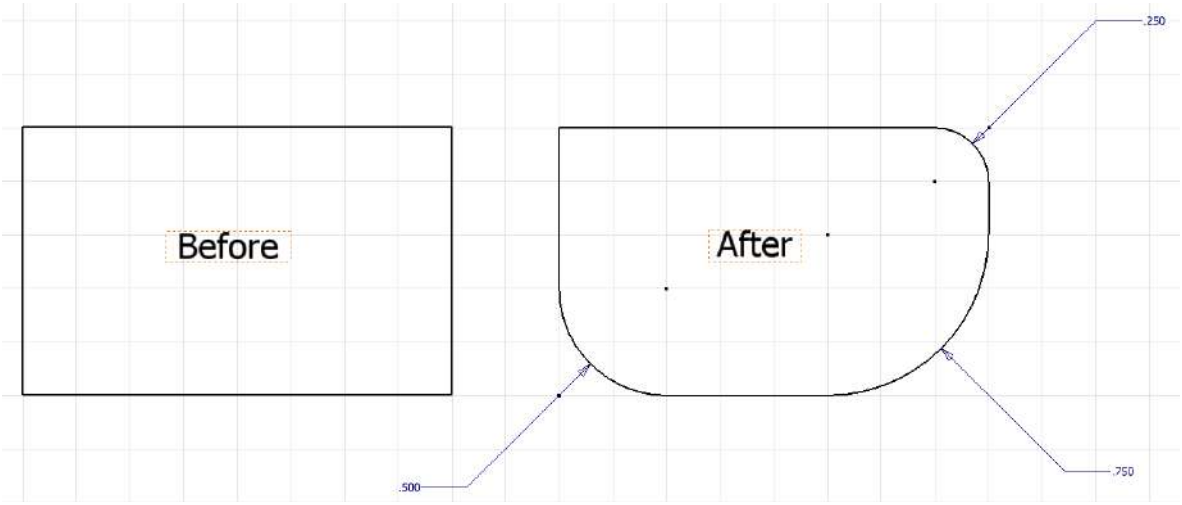
1. The spline tool is used to create irregular curves. Create a new CAD file, and use the **spline** sketch tool to draw the above. Note the locations and number of points in each spline.



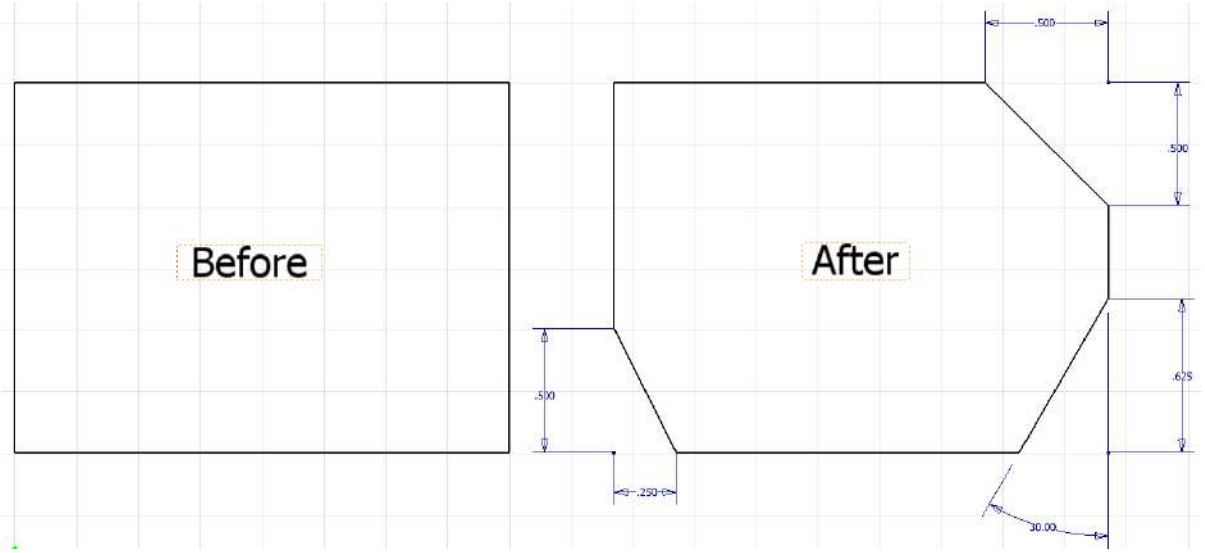
2. Create a new CAD file and use the **circle** and **ellipse** sketch tools to replicate the figures shown above. Label the images as shown using the **text** tool.



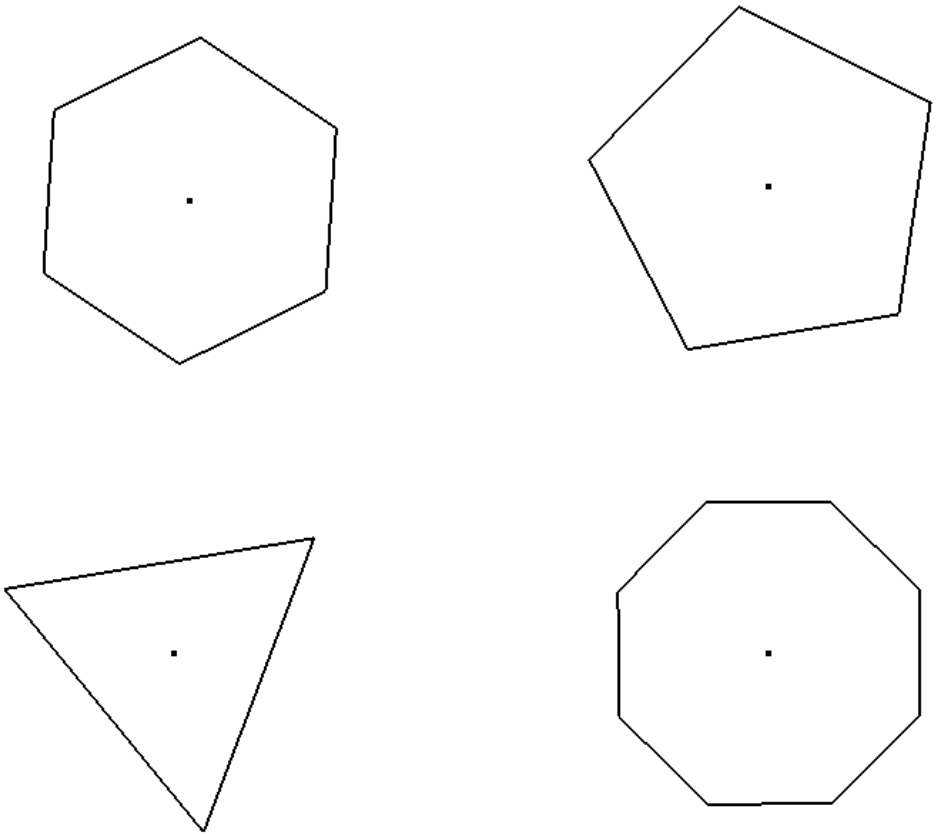
3. Create a new CAD file and use the **line** and **arc** sketch tools to replicate the figures shown above. Label the images as shown using the **text** tool.



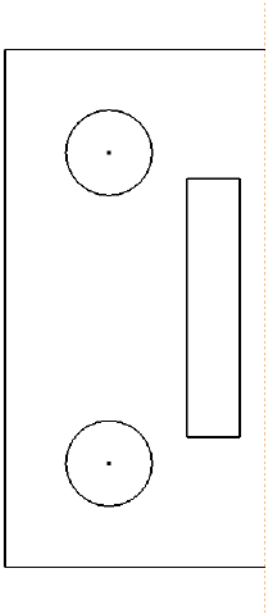
4. Create a new CAD file and draw a rectangle that is approximately 2 inches wide by 1.25 inches tall. Use the **fillet** sketch tool to round off the top right to .25 inch radius. Then, round off the bottom right corner with a .75 inch radius. Lastly, round off the bottom left hand corner with a .5 inch radius.



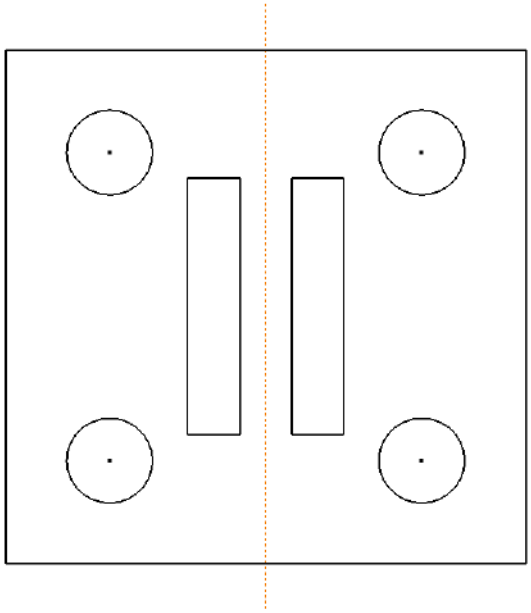
5. Create a new CAD file and draw a rectangle that is approximately 2 inches wide by 1.5 inches tall. Use the **chamfer** sketch tool and all three methods explained to create angles at the top right and bottom corners of the rectangle according to the dimensions given in the figure shown above.



6. Create a new CAD file and use the **polygon** sketch tool to draw the series of shapes pictured above. Use the text tool to label the names of each of the regular polygons.

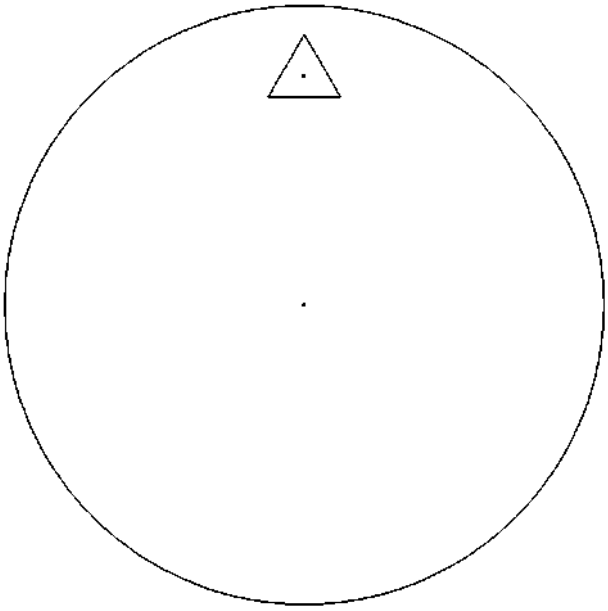


Before

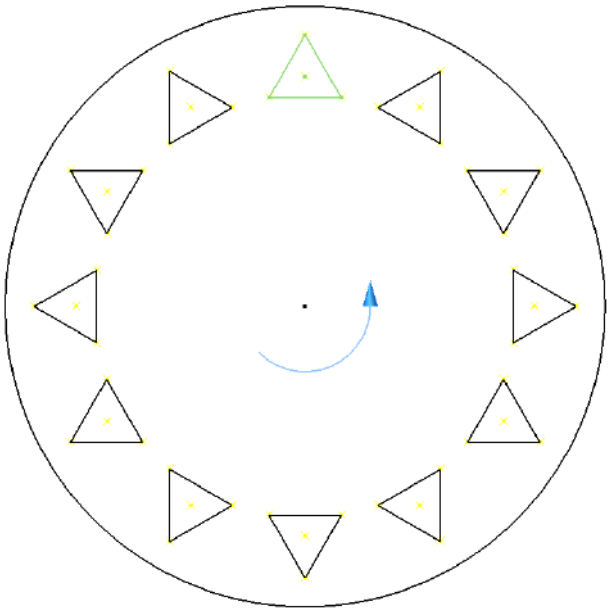


After

7. Create a new CAD file and use the line and circle sketch tools to create a similar figure to the one shown in the Before image. A regular vertical line may be used as the mirror line. The top and bottom horizontal edges must terminate at the vertical mirror line. Use the **mirror** sketch tool to mirror the figure across the mirror line.



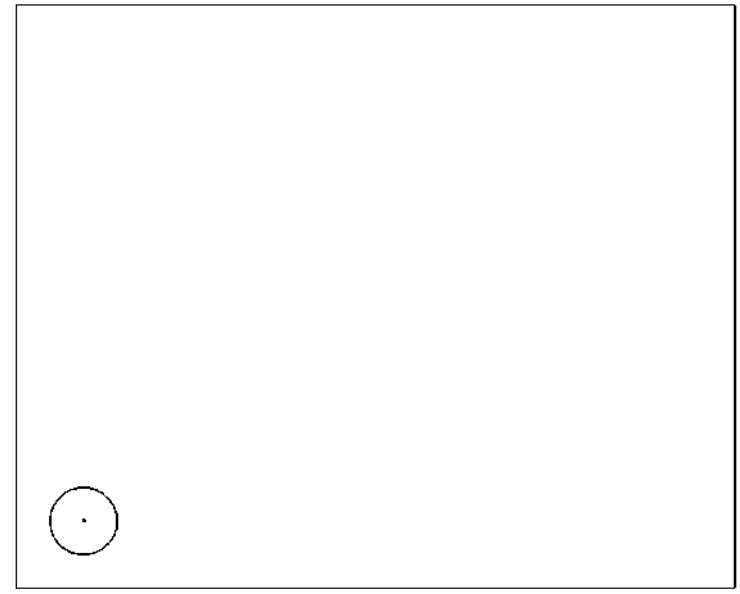
Before



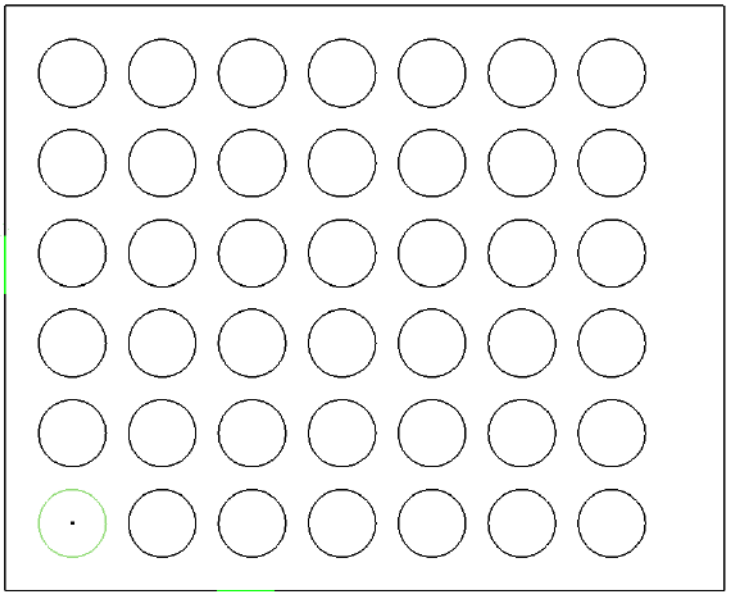
After

8. Create a new CAD file and draw a circle with a diameter of approximately 2.25 inches. Use the polygon sketch tool to create an isosceles triangle that would fit within a .25 inch diameter circle. Orient the triangle so that it is pointing toward the top quadrant of the circle. The center of the triangle should be approximately 7/8 inch from the center of the circle. Use the **pattern** sketch tool to create a copy of the triangle 12 times (the number of instances includes the object being patterned) around the center of the circle.

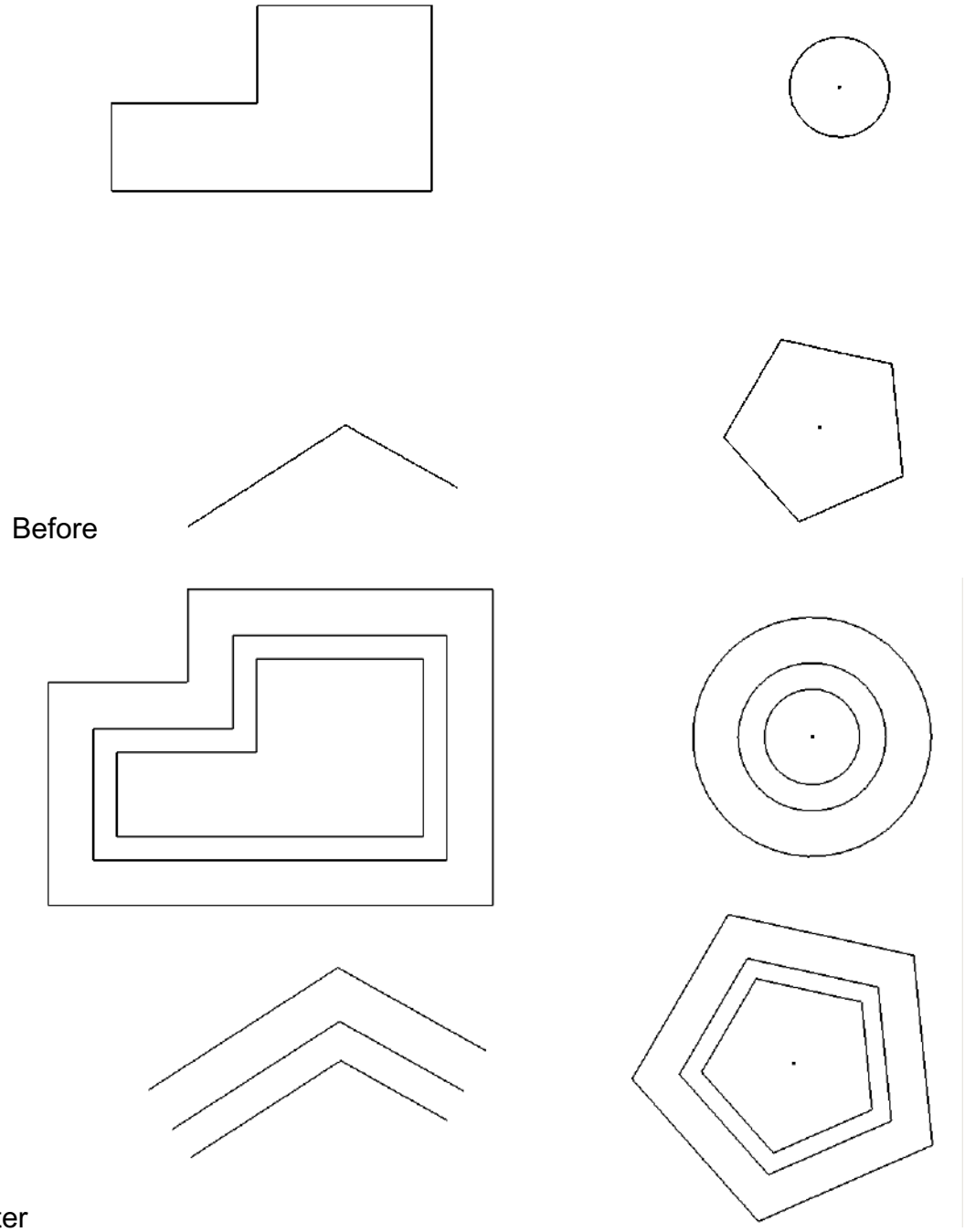
Before



After

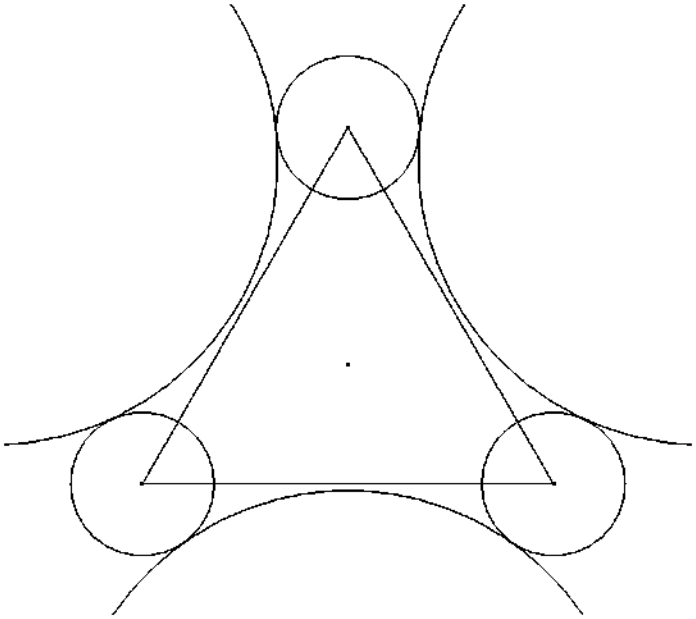


9. The **Pattern** sketch tool allows the designer to create a pattern from one or several objects. The direction or orientation of the pattern is derived from existing lines on the sketch. Create a new CAD file and draw a rectangle that is approximately 4 inches wide by 3.25 inches tall. Create a 3/8 inch diameter circle in the lower left hand corner. Locate the center of the circle approximately 3/8 inch from the bottom and left edges. Use the **pattern** sketch tool to create multiple copies of the circle. The circle pattern must have seven columns and six rows, and fit within the boundaries of the rectangle.

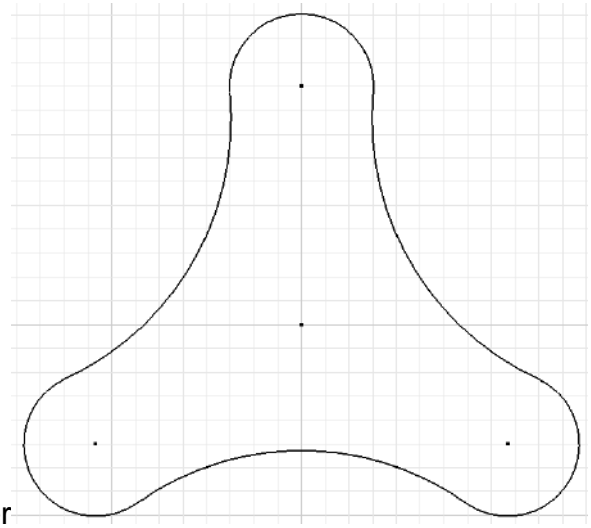


10. The need to create geometry that is identical in shape and parallel is very common in engineering design. The **Offset** sketch tool is used to make this process quick and accurate. Create a new CAD file and draw the figures pictured in the before image. Use the **Offset** sketch tool to offset the geometry of each figure outward two times.

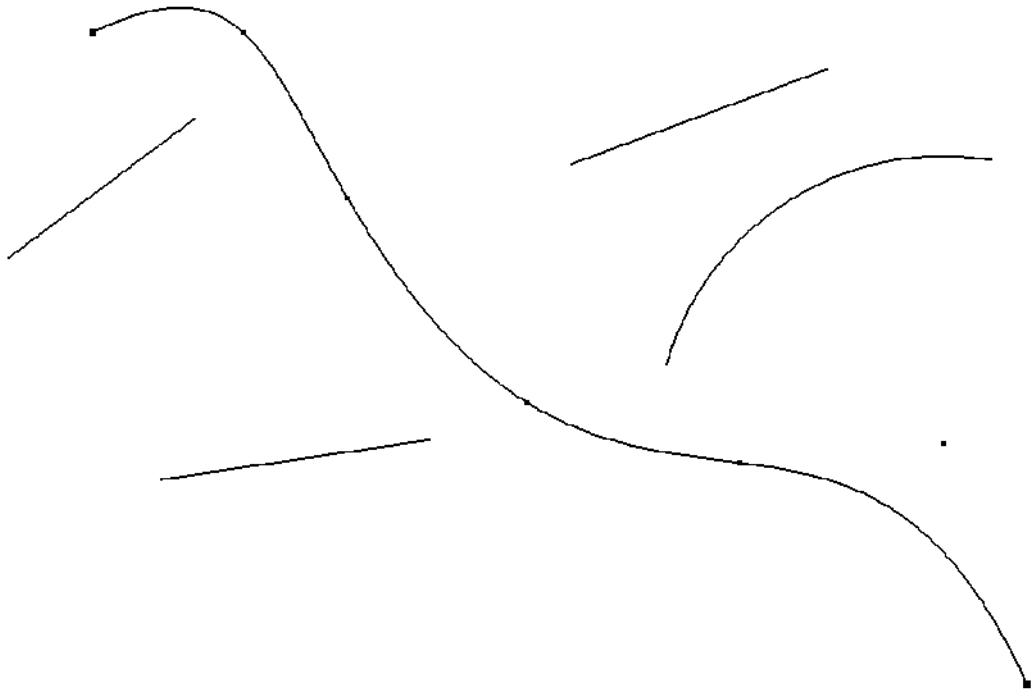
Before



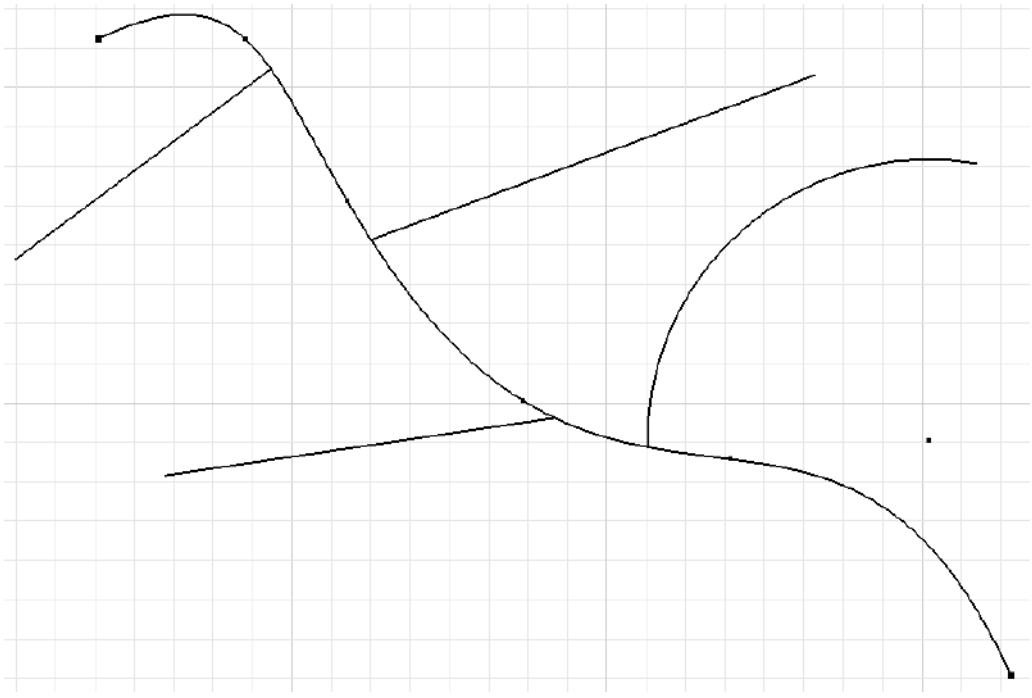
After



11. Draw the top picture using circles, lines, and arcs. Use the **Trim** sketch tool and make the after image. Save the file

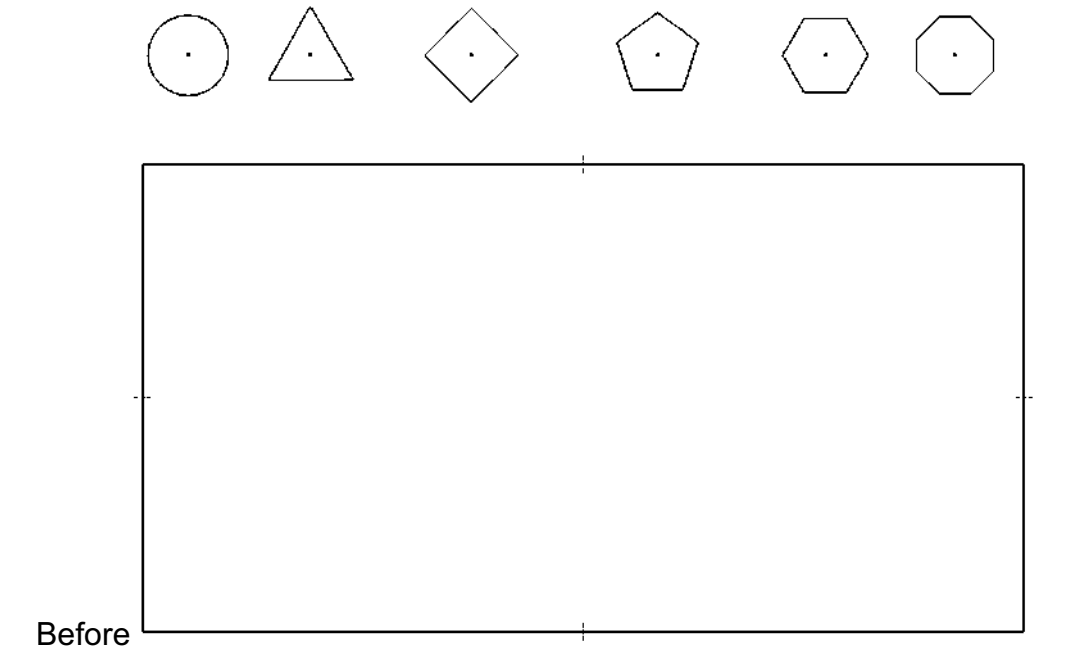


Before

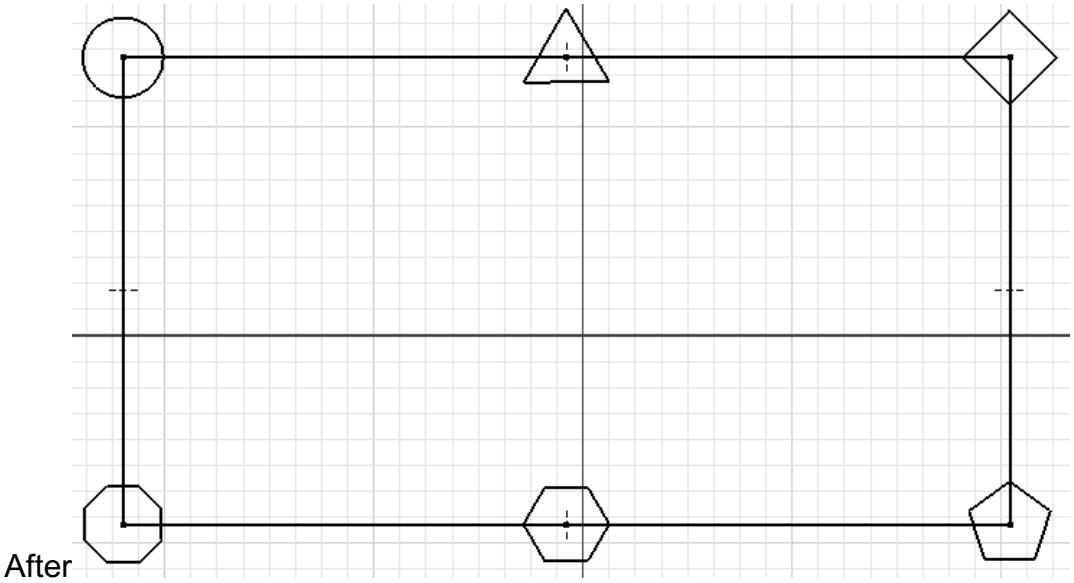


After

12. Draw the top picture using lines, spline, and arc. Use the **Extend** sketch tool to extend the straight lines to the spline. When finished, the sketch should look like the after image.



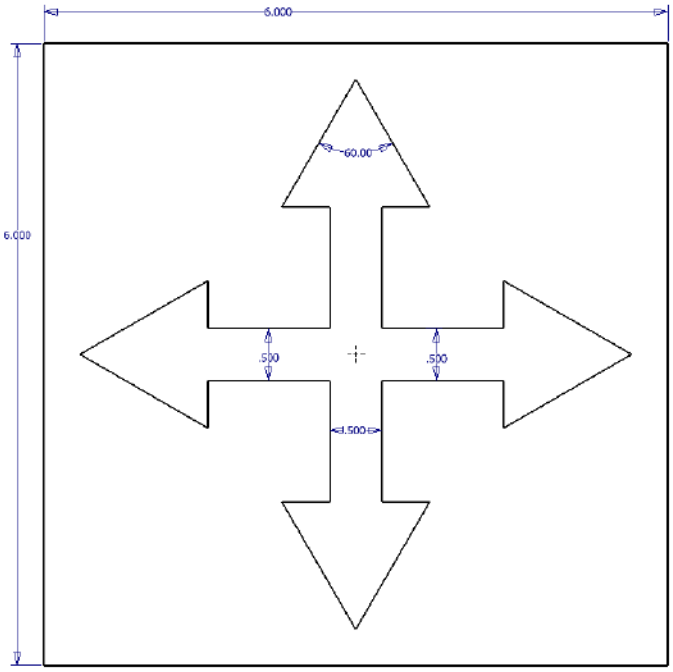
Before



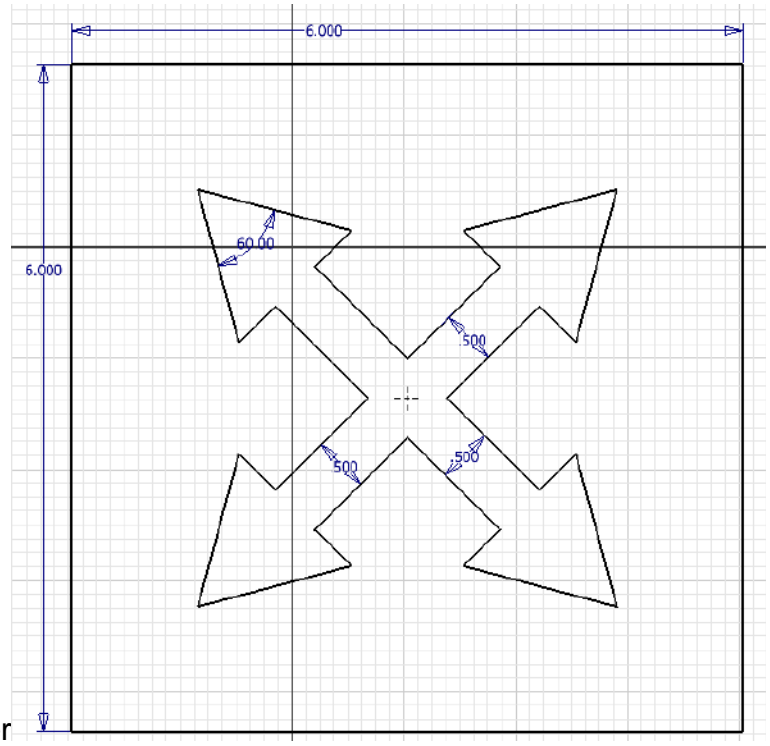
After

13. Create the top picture using the polygon tool and rectangle. Use the **Move** sketch tool to move the geometric shapes to the positions shown in the after image.

Before



After



14. Create the top image using line tool. Use the **Rotate** sketch tool to rotate the shape shown in the before image to look like the after image.