SVG Transformations

1. Copy text from http://steamcoded.org/graphpaper4q.svg.txt
   and paste into an editor, and save as transforms.svg
   Note: this file will adjust SVG coordinates to be like a normal piece of graph paper

2. On line 27, create a rectangle at the origin (0,0) with a width and height of 200. Add
   id and style attributes as shown
   `<rect id="r2" x="0" y="0" width="200" height="200" style="fill:green;stroke:black;" />`

Rotation:
3. Rotate the rectangle 45 degrees about its center by adding the transform attribute
   `transform="rotate(45,100,100)"`

Translation:
4. Move the rotated rectangle 41.4 pixels in both the x and y directions by modifying the
   transform attribute to read: `transform="translate(41.4,41.4) rotate(45,100,100)"`

Dilation:
5. Copy the rectangle and paste on the next line, then modify the first rectangle to have
   id="r1", change the fill color to gold, and change the transform attribute as shown
   `<rect id="r1" x="0" y="0" width="200" height="200" style="fill:gold;stroke:black;"`
   `transform="scale(1.414)" />`

Rotation:
6. Reuse the first rectangle by adding a `<use>` element on the line after rectangle 2 and
   rotate it about the origin (0,0) as shown:
   `<use xlink:href="#r1" transform="rotate(90,0,0)" />`

7. Copy the use element and paste 2 times on the next line, then change the rotation
   angles to be 180 and 270

Reflection:
8. Reuse the second rectangle by adding a `<use>` element on the next line and add a
   transform attribute to reflect it about the y-axis as shown.
   `<use xlink:href="#r2" transform="scale(-1,1)" />`
   This multiplies each of the x values by -1 and y values by 1

9. Copy the use element and paste on the next line, then change the scale value to reflect
   the rectangle about the x-axis.
   `<use xlink:href="#r2" transform="scale(1,-1)" />`
   This multiplies each of the x values by 1 and y values by -1

10. Copy the use element and paste on the next line, then change the scale value to reflect
    the rectangle about both the x-axis and the y-axis.
    `<use xlink:href="#r2" transform="scale(-1,-1)" />`
    This multiplies each of the x values by -1 and y values by -1

Creating a Fractal with Dilation and Translation:
11. Reuse the first rectangle by adding a `<use>` element on the next line. Add an
    id attribute, then add a transform attribute to scale it and move into position as shown:
    `<use id="r3" xlink:href="#r1" transform="translate(70.7,70.7) scale(0.5)" />`

12. Copy the 3 `<use>` elements from steps 8, 9, & 10 and paste on the next line, then
    Change the xlink:href attribute to reference r3 instead of r1

Another Fractal with Dilation and Translation
13. Copy the code from steps 11 & 12 (4 lines of code) and paste on the next line, then
    change the first `<use>` element to had id="r4" and xlink:href="#r2" and
    the other 3 `<use>` elements to reference r4, for example: xlinnk:href="#r4"

14. Continue the fractal as many times as you like. When finished change the group with
    id="grid" to have attribute style="display:none;" and
    the other `<g>` element to have opacity:1; instead of opacity:0.5;