Algorithm

1. Translation of a Triangle

Step 1: Input the triangle vertices (x1,y1), (x2,y2), (x3,y3).

Step 2: Input translation factors tx and ty.

Step 3: Draw the original triangle.

Step 4: Compute new coordinates:

$x' = x + tx$

$y' = y + ty$

Step 5: Draw the translated triangle using new coordinates.

Step 6: Stop the algorithm.

2. Scaling of Rectangle About Origin

Step 1: Input rectangle coordinates.

Step 2: Input scaling factors Sx and Sy.

Step 3: Draw the original rectangle.

Step 4: Compute new coordinates:

$x' = x \times Sx$

$y' = y \times Sy$

Step 5: Draw the scaled rectangle.

Step 6: Stop the algorithm.

3. Rotation of Triangle About Origin

Step 1: Input triangle vertices.

Step 2: Input rotation angle θ.

Step 3: Convert θ into radians.

Step 4: Draw original triangle.

Step 5: Compute rotated coordinates using:

$x' = x \cos\theta - y \sin\theta$

$y' = x \sin\theta + y \cos\theta$

Step 6: Draw rotated triangle.

Step 7: Stop the algorithm.

4. Reflection of Triangle

(a) About X-axis:

$x' = x$

$y' = -y$

(b) About Origin:

$x' = -x$

$y' = -y$

(c) About y = x:

$x' = y$

$y' = x$

(d) About y = mx + c:

Step 1: Translate line to origin.

Step 2: Rotate to align with x-axis.

Step 3: Reflect about x-axis.

Step 4: Reverse rotation and translation.

Step 5: Stop the algorithm.

5. Shearing of Rectangle

(a) Shear in X-direction:

$x' = x + Shx \cdot y$

$y' = y$

(b) Shear in Both Directions:

$x' = x + Shx \cdot y$

$y' = y + Shy \cdot x$

Step 1: Input rectangle coordinates.

Step 2: Input shear factors Shx and Shy.

Step 3: Draw original rectangle.

Step 4: Compute new coordinates using shear formulas.

Step 5: Draw sheared rectangle.

Step 6: Stop the algorithm.