## Algorithm: Translation of a Triangle

**Step 1:** Input triangle vertices

$A(x_1,y_1)$, $B(x_2,y_2)$, $C(x_3,y_3)$

**Step 2:** Input translation factors

tx, ty

**Step 3:** Apply translation formula

$A' = (x_1 + tx, y_1 + ty)$

$B' = (x_2 + tx, y_2 + ty)$

$C' = (x_3 + tx, y_3 + ty)$

**Step 4:** Store new translated vertices

**Step 5:** Plot original triangle

**Step 6:** Plot translated triangle

**Step 7:** Stop

## Algorithm: Scaling of Rectangle About Origin

**Step 1:** Input rectangle vertices

$(x_1,y_1)$, $(x_2,y_2)$, $(x_3,y_3)$, $(x_4,y_4)$

**Step 2:** Input scaling factors

sx, sy

**Step 3:** Apply scaling formula

$x' = x \times sx$

$y' = y \times sy$

**Step 4:** Compute scaled vertices

**Step 5:** Plot original rectangle

**Step 6:** Plot scaled rectangle

**Step 7:** Stop

## Algorithm: Rotation of Triangle About Origin

**Step 1:** Input triangle vertices
A(x,y)

**Step 2:** Input rotation angle $\theta$ (in degrees)

**Step 3:** Convert $\theta$ to radians
$\theta$ = radians($\theta$)

**Step 4:** Apply rotation formula
$x' = x \cos\theta - y \sin\theta$
$y' = x \sin\theta + y \cos\theta$

**Step 5:** Compute rotated vertices

**Step 6:** Plot original triangle

**Step 7:** Plot rotated triangle

**Step 8:** Stop

## Algorithm: Reflection of Triangle
**a) Reflection about X-axis**

**Step 1:** Input triangle vertices

**Step 2:** Apply reflection rule
$(x,y) \rightarrow (x, -y)$

**Step 3:** Compute reflected vertices

**Step 4:** Plot original triangle

**Step 5:** Plot reflected triangle

**Step 6:** Stop

**b) Reflection about Origin**

**Step 1:** Input triangle vertices

**Step 2:** Apply reflection rule
$(x,y) \rightarrow (-x, -y)$

**Step 3:** Compute reflected vertices

**Step 4:** Plot original and reflected triangle

**Step 5:** Stop

**c) Reflection about y = x**

**Step 1:** Input triangle vertices

**Step 2:** Apply rule
$(x,y) \rightarrow (y,x)$

**Step 3:** Compute reflected vertices

**Step 4:** Plot both triangles

**Step 5:** Stop

**d) Reflection about y = mx + c**

**Step 1:** Input triangle vertices

**Step 2:** Input line parameters m and c

**Step 3:** Convert line into form

$ax + by + c = 0$

where $a = m$, $b = -1$

**Step 4:** Compute distance factor

$d = (ax_0 + by_0 + c) / (a^2 + b^2)$

**Step 5:** Apply reflection formula

$x' = x_0 - 2ad$

$y' = y_0 - 2bd$

**Step 6:** Repeat for all vertices

**Step 7:** Plot original and reflected triangle

**Step 8:** Stop

## Algorithm: Shearing of Rectangle

**a) Shear in X-direction**

**Step 1:** Input rectangle vertices

**Step 2:** Input shear factor k

**Step 3:** Apply shear formula

$x' = x + k \times y$

$y' = y$

**Step 4:** Compute sheared vertices

**Step 5:** Plot original and sheared rectangle

**Step 6:** Stop

**b) Shear in X and Y Directions**

**Step 1:** Input rectangle vertices

**Step 2:** Input shear factors kx and ky

**Step 3:** Apply formulas
$x' = x + kx \times y$
$y' = y + ky \times x$

**Step 4:** Compute sheared vertices

**Step 5:** Plot both rectangles

**Step 6:** Stop