

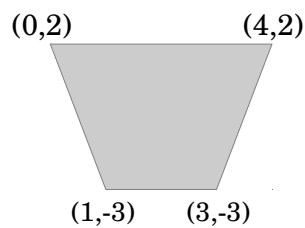
Mathematics for Computer Graphics Tutorial 9

1. Find **ABC** whenever possible

$$\text{a. } \mathbf{A} = \begin{bmatrix} 2 & 2 \\ 4 & 4 \end{bmatrix} \quad \mathbf{B} = \begin{bmatrix} -2 & 0 \\ 5 & -3 \end{bmatrix} \quad \mathbf{C} = \begin{bmatrix} 1 & -1 \\ 3 & -2 \end{bmatrix}$$

$$\text{b. } \mathbf{A} = \begin{bmatrix} 1 & 2 \\ 0 & 3 \\ 3 & 1 \end{bmatrix} \quad \mathbf{B} = \begin{bmatrix} 3 & -2 & 0 \\ 1 & 5 & 4 \end{bmatrix} \quad \mathbf{C} = \begin{bmatrix} -2 & 8 \\ 3 & 5 \\ 1 & 6 \end{bmatrix}$$

2. Considering the following shape,



- a. Scale the shape with a scaling factor of 2 in x -direction and 3 in y -direction; then translate it with $T_x=3$, $T_y=2$;
- b. Express each transformation in a matrix format.,
- c. Do the transformations in the reverse order: “translate then scale” the shape using the same scaling and translation.