2D

A point is represented in 2 dimension by its coordinates

These two values are specified as elements of 1 row 2 column matrix

     In two dimension   [x, y]   In three dimension [x, y,z]

Or alternatively a point is represented by a 2 row 1 column matrix

     In two dimension $\begin{bmatrix} x \\ y \end{bmatrix}$ **In three dimension** $\begin{bmatrix} x \\ y \\ z \end{bmatrix}$

and are called *Position Vectors*.

Vector has single direction and length and may be denoted by [D_x ,D_y].

       D_x indicates how far to move along x axis direction.

       D_y indicates how far to move along y axis direction.

Vectors tell us how far and what direction to move but hot where to start. e.g. command for pen to move so far from its current position in given direction.

A series of points each of which is a position vector relative to some coordinate system is stored in computer as matrix or array of numbers.

Position of these points is controlled by manipulating matrix that defines the points.

A straight line is transformed by transforming its end points then redrawing the line between the transformed end points.

A polygon is transformed by transforming its vertices then redrawing the line between the transformed vertices.

A curve is transformed by transforming its control point such as it's center point in case of a circle and then redrawing the curve using the transformed control points.