**Tutorial – 4**

**Computer Graphics**

1. **Write 2x2 transformation matrix for each of the following rotation about the origin.**
2. **clockwise by π/2**
3. **counter clockwise by π**
4. **Write 2x2 transformation matrix for each of the following scaling transformation**
   1. **The entire picture is 3 times as large**
   2. **The entire picture is 1/3 times large**
   3. **X direction is 4 times as large and Y direction is unchanged**
   4. **Y length is reduced to 2/3 of their original value and X length is unchanged**
   5. **X direction reduced to ¾ of their original value and Y direction increased by 7/5 times**
5. **Find the matrix that represents rotation of an object by 450 about the origin. What are the new coordinates of the point P(2,-4) after the rotation..?**
6. **A triangle is defined by 2x3 matrix . Find the transform coordinates after the following transformation.**
7. **900 rotation about origin**
8. **Reflection about line y=-x**
9. **Translate the square ABCD whose coordinates A(0,0) B(3,0) C(3,3) and D(0,3) by 2 units in both directions and then scale it by 1.5 units in X direction and 0.5 units in Y direction.**
10. **Perform a 450 rotation of triangle A(0,0) B(1,1) C(5,2)**
11. **About the origin**
12. **About point P(-1,-1)**
13. **Find the transformation matrix that transforms the square ABCD whose center is reduced to half of its size, with center still remaining at (2,2). The coordinates of square ABCD are A(0,0)B(0,4)C(4,4) and D(4,0). Find the coordinate of new square.**