ST. XAVIER’S COLLEGE

**(Affiliated to Tribhuvan University)**

**Maitighar, Kathmandu**

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**Computer Graphics**

**Numerical Assignment #2**

**SUBMITTED BY:**

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**SUBMITTED TO**

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Submission Date: 2015

1. Digitize a line with end points A(11,9) and B(29,17) using Bresenham’s Line drawing algorithm.

2. Digitize a circle with radius 12 and center (3,4) using mid point circle algorithm.

3. A triangle with vertices A(5,2),B(4,1),C(6,1) is required to be rotated in a clockwise direction by 45 degrees about any arbitrary point (4,4). Find out the final coordinate positions of the triangle after performing the desired transformation.

4. Reflect a Triangle A(1,0) B(3,1) C(1,2) about the line y = - **x +** 5

5. A triangle with vertices A(5,2),B(4,1),C(6,1) is required to be reflected about an arbitrary line y = 2x **+** 1. Find out the final coordinate positions of the triangle after performing the desired transformation.

6. A triangle with vertices A(5,2),B(4,1),C(6,1) is required to be rotated by 45 degrees in counter clockwise direction about i. origin and ii. line y = **5**

7. Clip a line with end point coordinates A(-1,6) B(5,-8) against a clip window with its lower left corner at (-2,-5) and upper right corner at (4,8) using Cohen Sutherland Algorithm.

8. Rotate triangle A(0,0), B(1,1), C(5,2) about origin and about point P(-1,-1) by 45 degrees in a counter clockwise direction.

9. Derive the composite transformation matrix that reflects an object about line ‘L’ with necessary figures.

10. Find scaling transformation matrix to scale units with respect to a fixed point P(x,y,z).

11. Use Cohen Sutherland’s algorithm to clip two lines (60,50) (100,10) against window (50,10) (80,40).

12. Show that 2D reflection thru x axis followed by 2D reflection thru line y = -x is equivalent to a pure rotation (90 degrees) about origin.

13. Prove that two successive rotation transformations commute.

14. Triangle with vertices A(1,1), B(7,1),C(4,3) is required to be rotated about any arbitrary fixed point (4,2) in a counter clock wise direction by 90 degrees. What will be the final coordinates of the triangle?