

Pop Quiz (Week 6) [10 mins] – 10 pts

Name: _____ Student ID: _____

Please show your work for partial credits.

- 1) **[1]** The efficiency of Sutherland-Hodgeman polygon clipping method stems from
 - a) **Pipelining**
 - b) Integer computations
 - c) Logic computations
- 2) **[1]** The efficiency of Liang-Barsky line clipping method of clipping stems from
 - a) Pipelining
 - b) **Integer computations**
 - c) Logic computations
- 3) **[1]** The efficiency of the Cohen-Sutherland line clipping method stems from
 - a) Pipelining
 - b) Integer computations
 - c) **Logic computations**
- 4) **[2+3+2 = 7]** Consider a diamond in 2D space given by the four coordinates (1,0), (0, 1), (-1, 0) and (0,-1).
 - a) Give the four coordinates of the axis aligned bounding box for this diamond.
In clockwise order starting from top right
(1, 1), (1, -1), (-1, -1), and (-1, 1)
 - b) Consider a rotation of this diamond by 45 degrees in the anticlockwise direction. What are the new bounding box vertices?

This will make the diamond a square making it its own axis aligned bounding box. The length of each side of the diamond is $\sqrt{2}$. Therefore the new bounding box, starting from top right and going clockwise is

($1/\sqrt{2}$, $1/\sqrt{2}$), ($1/\sqrt{2}$, $-1/\sqrt{2}$), ($-1/\sqrt{2}$, $-1/\sqrt{2}$) and ($-1/\sqrt{2}$, $1/\sqrt{2}$)
 - c) **Instead of a rotation**, consider a translation of the diamond by (1,1). What are the new bounding box vertices in this case?
The translation would mean the axis aligned bounding box is also translated by the same amount. Therefore, the new bounding box is
(2,2), (2,0), (0, 0) and (0,2)