CS4204 Computer Graphics Fall 2014
Homework Assignment 2

Assignment 2 is due on Monday, 9/22/2014 2:30pm. You need to turn your homework in to your instructor before class start. Please write clearly on paper.
**Note:** There are 10 points for each question.

Q1. Please explain when windows reshape callback event happens. And display callback event?

Q2. What is the 2D transformation matrix for rotate 60 degree around point (-1, 2)?

Q3. Let's represent 2D translation as TR(x,y), rotation as R(θ), scale as S(s_x, s_y). Please write down the series of transformations produces the reflection of a two dimensional point about an arbitrary line y = 3x+5? Show the 2D transformation matrix (using homogeneous coordinate system) of this transformation.

Consider the following three coordinate systems (O, A, B) for questions 5-8:
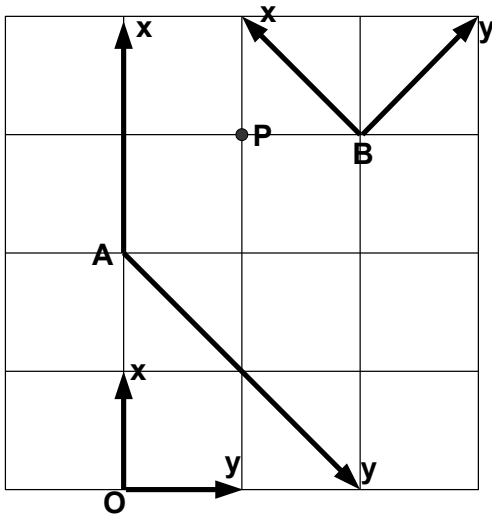
Notation: M_{ST} is a 3x3 homogeneous matrix that transforms points from coordinate system **S** to coordinate system **T**.

Q4. What are the coordinates of P in coordinate system **O**?

Q5. What are the coordinates of P in coordinate system **A**?

Q6. What are the coordinates of P in coordinate system $\boldsymbol{B}$?

Q7. What is the matrix of $\boldsymbol{M_{AB}}$? Please show the detail of derivation.

Q8. Express $\boldsymbol{M_{OB}}$ in terms of $\boldsymbol{M_{AO}}$ and $\boldsymbol{M_{BA}}$.