

Com S 229 Fall 2011

Problem Set 5 (10 pts)

Due at 10:59am

Friday, December 2

Name: _____

ID (4-digit): _____

1. (4 points) Drawing primitives. Make a drawing of what is displayed by the execution of the following OpenGL code. You can consider the color of the drawn primitives to be black.

a) (2 points) Lines.

```
glClear(GL_COLOR_BUFFER_BIT);
```

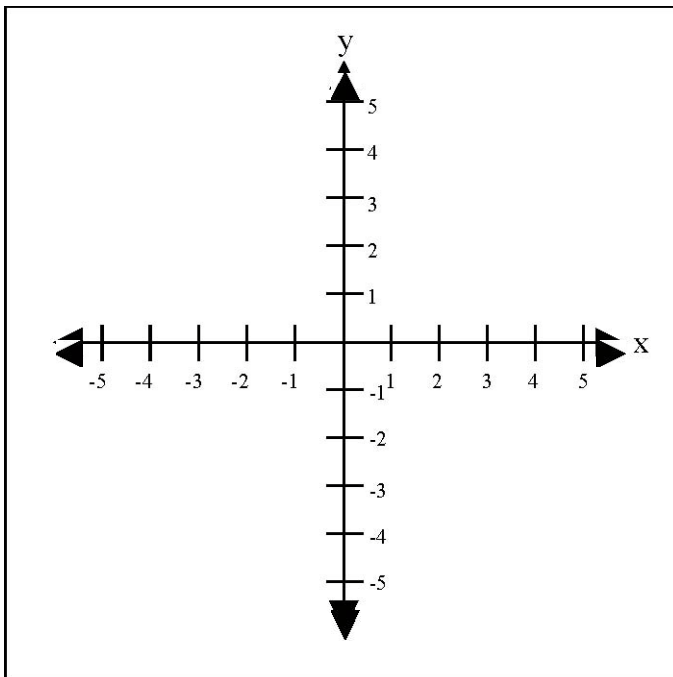
```
glBegin(GL_LINE_STRIP);
```

```
glVertex2f(-2.0,4.0);
```

```
glVertex2f(1.0,1.0);
```

```
glVertex2f(5.0,-2.0);
```

```
glEnd(); glFlush();
```



b) (2 points) Triangles.

```
glClear(GL_COLOR_BUFFER_BIT);
```

```
glBegin(GL_TRIANGLES);
```

```
glVertex2f(-1.0,0.0);
```

```
glVertex2f(0.0,3.0);
```

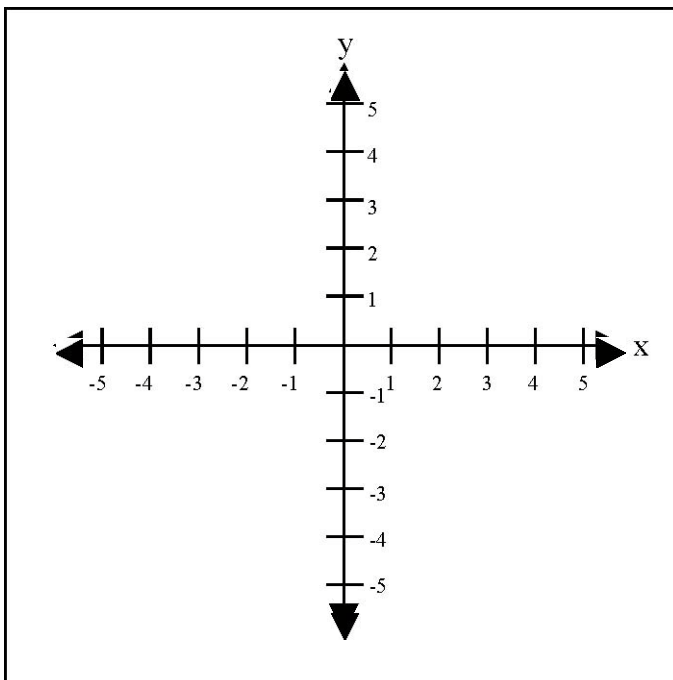
```
glVertex2f(1.0,0.0);
```

```
glVertex2f(-1.0,0.0);
```

```
glVertex2f(1.0,0.0);
```

```
glVertex2f(0.0,-3.0);
```

```
glEnd(); glFlush();
```



2. (3 points) Transformations. Calculate the transformed position of the 3 drawn points after the following translation and scaling transformations are applied.

```
glMatrixMode(GL_MODELVIEW);
glLoadIdentity();

glScalef(1.0,2.0,1.0);

glBegin(GL_POINTS);

    glVertex2f(1.0,1.0); //Point 1

    glVertex2f(0.0,0.0); //Point 2

glEnd();

glPushMatrix();

    glLoadIdentity();

    glTranslatef(50.0, 10.0, 0.0);

    glBegin(GL_POINTS);

        glVertex2f(-2.0,5.0); //Point 3

    glEnd();

glPopMatrix();
```

Transformed values of the points:

Point 1 = [_____, _____]

Point 2 = [_____, _____]

Point 3 = [_____, _____]

3. (3 points) Projections. Determine the values for the arguments for the `glOrtho(...)` method that will set up the following projection.
- The width of the projection should be 4 times the width of the window.
 - The height of the projection should be 0.5 times the height of the window.
 - The origin `[0,0]` should be located in the center of the window.
 - The projection should have a near plane of distance 2 from the viewpoint.
 - The projection should have a far plane of distance 150 from the viewpoint.

You are given a window of width 800 pixels, and height 600 pixels.

```
glOrtho(_____, _____, _____, _____, _____, _____);
```