

**Name:**

**Student ID:**

## CS130 Homework 4

1. Perspective transformations

- I. are linear transformations
- II. keep parallel lines parallel
- III. are affine transformations

- (a) I only
- (b) II only
- (c) III only
- (d) I, II and III
- (e) None

2. (T / F) Given invertible matrices  $M_1$ ,  $M_2$ , and  $M_3$ ,  $(M_3M_2M_1)^{-1} = M_1^{-1}M_2^{-1}M_3^{-1}$ .

3. (T / F) If a function is linear it is also affine.

4. (T / F) All rotations in 3D space can be specified with 2 real numbers.

5. (T / F) The inverse of a translation matrix is its transpose.

6. (T / F) dividing the resulting  $(x, y, z)$  coordinates by the homogeneous coordinate  $w$  is part of the projection transform.

7. (T / F) Translation affects vectors the same as points.

8. What is the matrix on top of the current matrix stack after the following functions are called?

```
glLoadIdentity();
glScalef(2,2,1);
glPushMatrix();
glScalef(1,1,1);
glTranslatef(1,0,0);
glPushMatrix();
glTranslatef(1,0,0);
glPopMatrix();
glPopMatrix();
glTranslatef(2,0,0);
```