2. (a) Giving examples, distinguish between diffuse and specular reflection. [4]

   (b) Describe and illustrate the Phong lighting model for a single point light source. Explain carefully the purpose of the parameters of the model. [7]

   (c) Calculate an expression for the Phong *shading* value at the origin, of a triangle with vertices:

$$(-2, -2, 0) \quad (4, -2, 0) \quad (0, 2, 0),$$

   if the vertices have corresponding illumination and normal values:

$$I_1, \mathbf{n}_1 \quad I_2, \mathbf{n}_2 \quad I_3, \mathbf{n}_3.$$

   [7]

   (d) Explain how texture mapping works, giving the necessary coordinate transformations required. [5]

   (e) An image needs to be mapped to a rectangle of size `width` by `height` in OpenGL. Give the missing statements in the following code fragment which specifies source and target coordinates:

```
glBegin(GL_QUADS);
    // missing statement 1
    glVertex2i(0, 0);
    // missing statement 2
    glVertex2i(width, 0);
    // missing statement 3
    glVertex2i(width, height);
    // missing statement 4
    glVertex2i(0, height);
glEnd();
```

   [2]