

LS 499 Building 3D Models for the Web

Assignment 2 Drs. Alarcón and Donley

Name: _____

# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	Total
9 pts	9 pts	9 pts	30 pts	30 pts	15 pts	15 pts	20 pts	20 pts	10 pts	10 pts	5 pts	182 pts

Instructions: This assignment is to be completed and to be turned in by 3:00 pm on Friday Sept. 24th.. Attach paper sheets to this one with your work.

- Convert the following angles from degrees to radians.
 - $\theta^\circ = -55^\circ$
 - $\theta^\circ = 270^\circ$
 - $\theta^\circ = 200^\circ$
- Convert the following angles from radians to degrees.
 - $\theta = \frac{2}{3}\pi$
 - $\theta = 3\pi$
 - $\theta = -1$
- If you wanted to create a paddlewheel consisting of 12 blades, what is the angle between two adjacent blades?
- For each of the starting and ending directions given below find the direction of rotation and angle of rotation.
 - $d_{\text{start}} = (1, 1, 0)$ $d_{\text{end}} = (1, 2, -1)$
 - $d_{\text{start}} = (1, 1, -2)$ $d_{\text{end}} = (1, 3, 1)$
- Suppose that you create in VRML a cone of height 4 and radius 1. You want to rotate the cone so that the tip of it will be pointing in the final direction given. What would be the direction of rotation and angle of rotation? (You will need to think about what the initial direction is now.)
 - $d_{\text{end}} = (1, 1, 1)$
 - $d_{\text{end}} = (1, -1, 0)$
- If a cone is initially facing upward, what rotation is required to face it to the left? Give the four values that would be used in the VRML code for the rotation transformation.
- Suppose that a pencil is initially pointing toward the viewer. Describe the position of the pencil after it is rotated 90° about the direction $d = (1, 1, 0)$.

8. What are the coordinates of the center of the sphere generated by the following code?

```
Transform {  
  scale 2 2 2  
  children [  
    Transform {  
      translation 1 3 2  
      children [  
        Shape {  
          geometry Sphere { }  
        }  
      ]  
    }  
  ]  
}
```

9. What are the coordinates of the center of the sphere generated by the following code?

```
Transform {  
  translation 1 3 2  
  children [  
    Transform {  
      scale 2 2 2  
      children [  
        Shape {  
          geometry Sphere { }  
        }  
      ]  
    }  
  ]  
}
```

10. Which is darker, 0 0.4 0 or 0 0.8 0? Give an appropriate name to each of these colors, such as dark yellow or pink?
11. What are the RGB values in VRML's RGB color scheme
 - a. for white?
 - b. for black?
12. If Photoshop lists a color in RGB mode as 150, 51, 0, what would be the RGB values for this color in VRML's RGB color scheme?