

LS 499 Building 3D Models for the Web Fall 1999 Assignment 1

Drs. Alarcón and Donley

Name: _____ ID#: _____

Instructions

This first assignment is to be completed and to be turned in on or before Friday Sept. 10th at 3:00pm. If you have some difficulties we can help you. Attach additional paper sheets as needed. Return this with your completed assignment!

Problem	1	2	3	4	5	Total
Points	15	15	10	30	30	100

1. Problems about points in 2D

- a. Sketch on the same set of coordinate axis the following points

$$A = (3, -1) \quad B = (2, -3) \quad C = (-1, -3) \quad D = (0, 2) \quad E = (2, 4)$$

- b. Give the coordinates of a point Q that would be four units below the point $P = (3, 2)$

$$Q = (\quad , \quad)$$

- c. Give the coordinates of a point Q that would be three units to the right of the point

$$P = (1, -1)$$

$$Q = (\quad , \quad)$$

2. Problems about points in 3D

- a. Sketch on the same set of coordinate axis the following points

$$A = (0, 0, 2) \quad B = (2, 3, 2) \quad C = (-1, -3, 1)$$

- b. Give the coordinates of a point Q that would be five units below the point $P = (2, -4, 2)$.

$$Q = (\quad , \quad , \quad)$$

- c. Give the coordinates of a point Q that would be two units above and one unit to the left of the point $P = (-1, 0, -4)$.

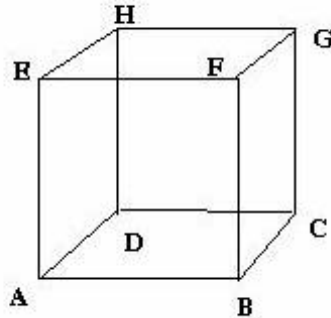
$$Q = (\quad , \quad , \quad)$$

3. Which of the following two points is farther from the origin, $P = (1, 0, 0)$ or $Q = (0, 1, 1)$. Also give a short explanation. If you don't think one is farther than the other, explain why.

Hint: A sketch of where the points are might help you.

4. More on problems in 3D

- a. Suppose that we place a cube of side of length 5 units in a coordinate system in space in such a way that the center of the cube is at the point $Center = (-1, 2, 3)$. Give the coordinates of the vertices of the cube (see diagram below). Use the VRML orientation for the axes.



$$A = (\quad , \quad , \quad) \quad B = (\quad , \quad , \quad) \quad C = (\quad , \quad , \quad) \quad D = (\quad , \quad , \quad)$$

$$E = (\quad , \quad , \quad) \quad F = (\quad , \quad , \quad) \quad G = (\quad , \quad , \quad) \quad H = (\quad , \quad , \quad)$$

- b. Repeat part a but assume now that we place the cube so that the vertex D is at the origin.

$$A = (\quad , \quad , \quad) \quad B = (\quad , \quad , \quad) \quad C = (\quad , \quad , \quad) \quad D = (0, 0, 0)$$

$$E = (\quad , \quad , \quad) \quad F = (\quad , \quad , \quad) \quad G = (\quad , \quad , \quad) \quad H = (\quad , \quad , \quad)$$

Give the coordinates of the center too. $Center = (\quad , \quad , \quad)$

5. Suppose that you want to build a wall out of square blocks. The seams between the blocks in a row should be staggered with the seams in the next row, which is the standard method of laying bricks. If the blocks are 2 meters by 2 meters by 2 meters, where should the centers of the blocks be to produce the wall pictured below? The thin cylinders are the x , y and z axes.

