CSE-4303 CSE5365 Computer Graphics
Practice Lines and Planes

Given the points A(2,4,7) and B(5,-2,3), find the equation of the line which is passing through points A and B

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Find the equation of a plane which is passing through point $A\ (6, -5, -3)$ and is perpendicular to vector

$v_1 = (2,4,-3)$

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Equations of plane P are given as:

Plane P: $\mathbf{5x + 6y + 7z - 11 = 0}$

Find the equation of plane P after it has been translated by

$$\mathbf{dx = 6}\ , \qquad \mathbf{dy = 9}\ , \qquad \mathbf{dz = -2}$$

Equation of plane P after translation is:

x + y + z + =0

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Practice Lines and Planes

Given the points **A(0,6,3)** and **B(4,2,3)**, find the intersection point of line AB with the plane

$$\boldsymbol{2x + y - 5z - 7 = 0}$$

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Given the points **A(3,-2,4)** and **B(5,1,9)**, and plane $-2x - 5y + 3z - 18 = 0$

a. Find the parametric equation of line AB

Point A	Point B	Equation of line			
3.00	**5.00**	x(t)=	+2.0	t	+3.0
-2.00	**1.00**	y(t)=	+3.0	t	-2.0
4.00	**9.00**	z(t)=	+5.0	t	+4.0

b. Find the intersection of line AB with the plane:

The intersection point is: **x= ___ y= ____ z= ____**

t	x	y	z
-0.500	2	-3.5	1.5

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Given points **A(5, -1, 2)** and **B(-4 , 1 , 3).** and **C(4 , 1 , 2).**

a. Find the equation of the plane which is passing through these points.

b. Find the equation of this plane after it has been rotated 90 degrees around z axis

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Equations of plane P is given as: $\boldsymbol{4x - 5y + 3z + 10 = 0}$

Find the equation of plane P after it has been translated by

$\boldsymbol{dx = 3}$, $\boldsymbol{dy = 1}$, $\boldsymbol{dz = -5}$

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Given the equation of the line L : $\begin{cases} x(t) = 4t \\ y(t) = -5t + 2 \\ z(t) = 2t + 3 \end{cases}$

Find the equation of this line after it has been rotated 90 degrees around the y axis.

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Equations of plane P and line L are given as:

Plane P: $\mathbf{5x + 6y + 7z - 11 = 0}$

Line L : $\begin{cases} \boldsymbol{x(t) = 2} \\ \boldsymbol{y(t) = -3t} \\ \boldsymbol{z(t) = 4t + 3} \end{cases}$

a. Find the point of intersection of line L with plane P.

Intersection point of line L and plane p is: _____

b. Find the equation of plane P after it has been translated by

$\boldsymbol{dx = 6}$, $\boldsymbol{dy = 9}$, $\boldsymbol{dz = -2}$

Equation of plane P after translation is:

x + y + z + =0

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Given the points **A(0,0,0)** and **B(8,6,0)**, find the sequence of rotation matrices to make the line **AB** to be aligned with the **z** axis:

Matrix #2

Matrix #1

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Given the points **A(2,1,-4)** and **B(8,6,0)**, **C(3,4,-5)** and **D(4,2,-3)**,Find the equation of line **AB** after it has been rotated **60** degrees around line **CD**.

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Given the plane P as 4x-3y+5z+32=0 and two points A(8,2,5) and B(8,2,8). Find the equations of plane P after it has have been rotated =90 degrees around AB.

Show the matrices:

Show the equation of the rotated plane P:

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Given the plane P as 4x-3y+5z+32=0 and two points A(8,2,5) and B(2,-3,6). Find the equations of plane P after it has have been rotated =90 degrees around AB.

Show all the matrices:

Show the equation of the rotated plane P:

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1. Line AB and point C(8,2,-4) are on the same plane. Equation of the line is given as: $\begin{cases} x(t) = 4t - 1 \\ y(t) = 5t \\ z(t) = 3t - 7 \end{cases}$

Find the equation of this plane

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Given two pints A(2,3,4) and B(14,6,8), find the sequence of transformations to bring the point A to the origin and make point B to be on the z axis.

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Given point **A (5,4 3)** and plane P as: **2x-8y-3z-24=0**.

a. Find the equation of a line which is passing through point A and is perpendicular to plane P.

Equation of the line is:

b. Find the equation of a line which is passing through point A and is parallel to plane P.

Equation of the line is:

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Practice Lines and Planes

Given triangle ABC three dimensional right-handed coordinate system,

A=(10,0,20), B=(40,20,0), C=(0,60,40)

Find the z coordinates of point P (10,15,?) which is on the same plane as triangle ABC

Z coordinate of point P is: _____

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Given three points A(1,2,3) , B(2,4,0) , C(0,1,0) and line L $\begin{cases} x(t) = 9t + 8 \\ y(t) = t + 1 \\ z(t) = 9t + 6 \end{cases}$

a. Find the equation of the plane P which is passing through points A, B, and C

Show the equation of plane P:

x + y + z + =0

b. Find the intersection of line L with plane P

Show Intersection Point:

X= Y= Z=

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Given the equation of plane P: **3x - 6y + 8z + 1=0**

Find the equation of this plane after it has been rotated 90 degrees around line AB

A=(1,2,3) B= (16,14,19)

Positive direction for rotation is defined as counter-clock-wise looking from B to A.

Matrix #2

Matrix #1

Matrix #4

Matrix #3

Matrix #6

Matrix #5

Matrix #8

Matrix #7

Show the equation of the rotated plane P:

x + y + z + =0