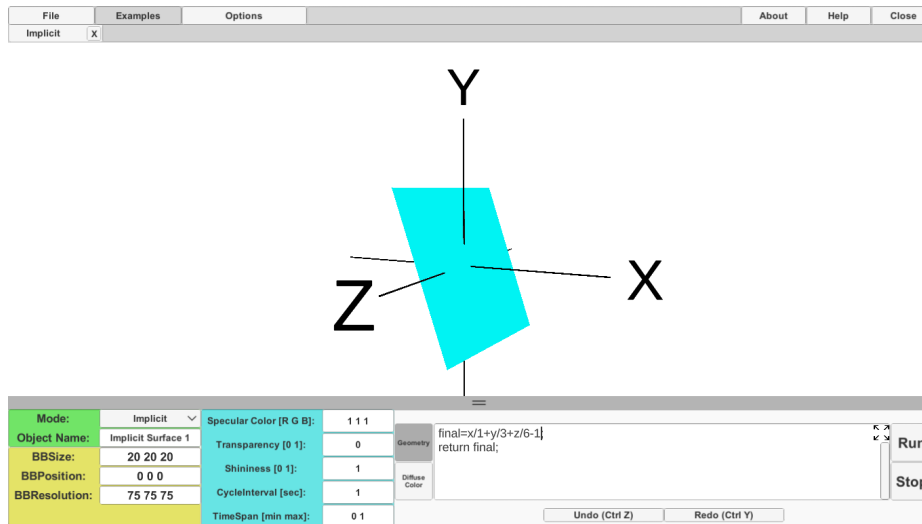


Q1. implicit function : $\frac{x}{1} + \frac{y}{3} + \frac{z}{6} - 1 = 0$

N2202781D

Nie Yu he



Q2 the orthogonal line pass through

$P_1(2, -1, 1) \quad u=0$

$P_2(3, 0, 4) \quad u=1$

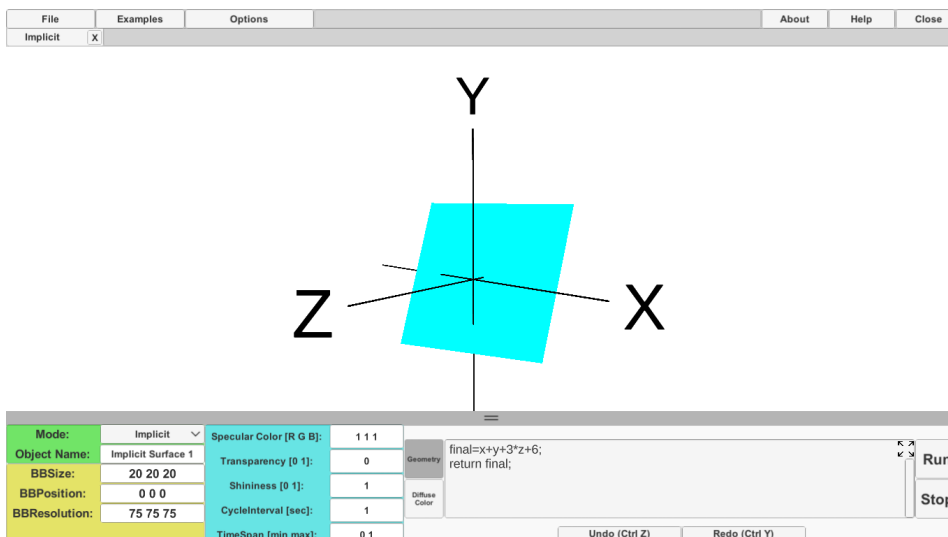
one of the vector that orthogonal to the plane
is $\vec{N} = P_2 - P_1 = (1, 1, 3)$

\therefore the plane passes through $(1, 2, -3)$

\therefore the implicit function of the plane is

$$1 \cdot (x-1) + 1 \cdot (y-2) + 3 \cdot (z+3) = 0$$

$$\Rightarrow x + y + 3z + 6 = 0$$



$$Q3 \quad P_1 = (-3, 0, 0)$$

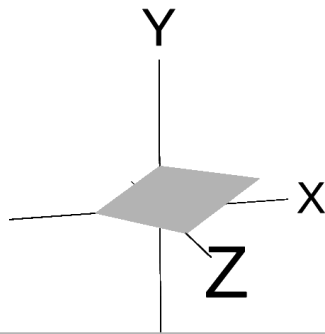
$$P_2 = (0, 2, 0)$$

$$P_3 = (0, 0, 4)$$

$$\text{Then } P = P_1 + u(P_2 - P_1) + v(P_3 - P_1)$$

$$\begin{cases} x = -3 + 3u + 3v \\ y = 2u \\ z = 4v \end{cases}$$

File	Examples	Options	About	Help	Close
Parametric	x				



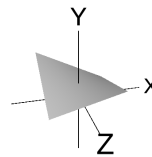
Mode:	Parametric	Specular Color [R G B]:	1 0 0	Geometry $x = -3 + 3u + 3v;$ $y = 2u;$ $z = 4v;$	Run Stop
Object Name:	Parametric Surface 1	Transparency [0 1]:	0		
Domain:	0 1 0 1	Shininess [0 1]:	1		
Resolution:	30 30	CycleInterval [sec]:	1		
		TimeSpan [min max]:	0 1		

$$Q4 \quad P = P_1 + u(P_2 - P_1) + v(P_3 - P_1 + u(P_4 - P_3 - (P_2 - P_1)))$$

$$(a) \quad P = (-1, 1, -1) + u(2, -1, 0) + v(0, -1, 2) + u(0, 1.5, 0)$$

$$\begin{cases} x = -1 + 2u \\ y = 1 - u + v(-1 + 1.5u) \\ z = -1 + 2v \end{cases}$$

File	Examples	Options	About	Help	Close
Parametric	x				



$$(b) \quad u = 0.2, \quad v = 0.4$$

$$x = -1 + 0.4 = -0.6$$

$$y = 1 - 0.2 + 0.4(-1 + 0.3) = 0.52$$

$$z = -1 + 0.8 = -0.2$$

$$P_0 = (-0.6, 0.52, -0.2)$$

Mode:	Parametric	Specular Color [R G B]:	1 0 0	Geometry $x = -1 + 2u;$ $y = 1 - u + v(-1 + 1.5u);$ $z = -1 + 2v;$	Run Stop
Object Name:	Parametric Surface 1	Transparency [0 1]:	0		
Domain:	0 1 0 1	Shininess [0 1]:	1		
Resolution:	30 30	CycleInterval [sec]:	1		
		TimeSpan [min max]:	0 1		

Q5 we need to find the intersection of three lines

$$P_1: \begin{cases} 1+2u=3-t \\ 1+u=2+t \\ 1-u=4t \end{cases} \Rightarrow \begin{cases} u=1 \\ t=0 \end{cases} \Rightarrow P_1(3, 2, 0)$$

$$P_2: \begin{cases} 3-u=2-t \\ 2+u=3-2t \\ 4u=4-3t \end{cases} \Rightarrow \begin{cases} u=1 \\ t=0 \end{cases} \Rightarrow P_2(2, 3, 4)$$

$$P_3: \begin{cases} 1+2u=2-t \\ 1+u=3-2t \\ 1-u=4-3t \end{cases} \Rightarrow \begin{cases} u=0 \\ t=1 \end{cases} \Rightarrow P_3(1, 1, 1)$$

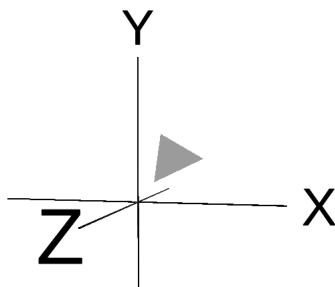
Suppose $P_4 = P_3 = (1, 1, 1)$

$$P = P_1 + u(P_2 - P_1) + v(P_3 - P_1 + u(P_4 - P_3 - (P_2 - P_1)))$$

$$P = (3, 2, 0) + u(-1, 1, 4) + v(-2, -1, 1) + u(1, -1, -4)$$

$$\begin{cases} x = 3 - u + v(-2 + u) \\ y = 2 + u + v(-1 - u) \\ z = 4u + v(1 - 4u) \end{cases}$$

File	Examples	Options	About	Help	Close
Parametric	x				



Mode:	Parametric	Specular Color [R G B]:	1 0 0	Geometry	$x=3-u+v(-2+u);$ $y=2+u+v(-1-u);$ $z=4u+v(1-4u);$	Run
Object Name:	Parametric Surface 1	Transparency [0 1]:	0	Diffuse Color		Stop
Domain:	0 1 0 1	Shininess [0 1]:	1			
Resolution:	30 30	CycleInterval [sec]:	1			
		TimeSpan [min max]:	0 1			

Undo (Ctrl Z) Redo (Ctrl Y)