

QUATERNION EXAMPLE

10/7/10 #15-

ROTATE $\boxed{(1, 2, 2)}$ ABOUT $(1, 1, 0)$ BY 180°
 $P = 1\underline{i} + 2\underline{j} + 2\underline{k}$ $a = (\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}, 0)$ \ominus

$$\frac{\theta}{2} = 90$$

$$q = 0 + 1 \cdot \left(\frac{1}{\sqrt{2}} + \frac{j}{\sqrt{2}} \right) = \frac{1}{\sqrt{2}} (1 + j)$$

$$q^* = -\frac{1}{\sqrt{2}} (1 + j)$$

$$P' = q^* P q = \frac{1}{\sqrt{2}} (1 + j) (1 + 2j + 2k) \left(-\frac{1}{\sqrt{2}} (1 + j) \right)$$

$$= -\frac{1}{2} (-1 + 2k - 2j - k - 2 + 2i) (1 + j)$$

$$= -\frac{1}{2} (-3 + 2k - 2j + k) (1 + j)$$

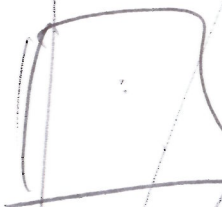
$$= -\frac{1}{2} (-3i - 3j - 2 + 2k + 2k + 2 + j + 3k)$$

$$= -\frac{1}{2} (-6j + 4k) = 3j - 2k$$

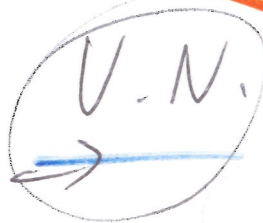
$(2, 1, -2)$
 $\rightarrow \boxed{(0, 3, -2)}$
~~ERROR~~

CARTESIAN

PERSPECTIVE



CUBE
 (x, y, z)



$(\frac{x}{2}, \frac{y}{2}, \frac{z}{2})$

$z=1$

$(\frac{x}{2}, \frac{y}{2}, 1)$

$(0, 0, 0)$

PART
OF

$(\frac{x}{2}, \frac{y}{2}, 1)$

TRANSFORMATIONS
 4×4

ORIG PROJECTION
PERSPECTIVE

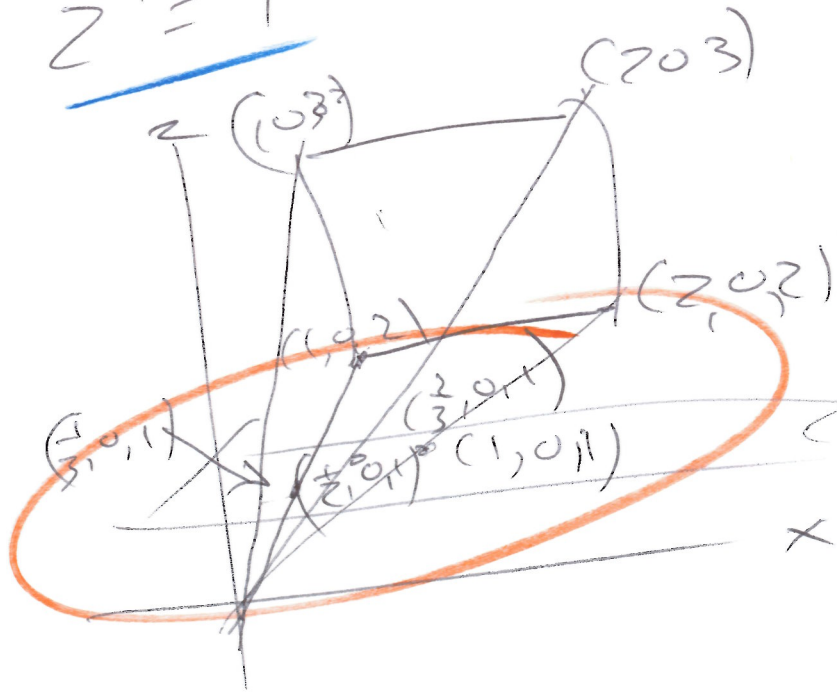
(OP 1000)

P. PLANE $Z=1$

$$X' = \frac{X}{Z}$$

$$Y' = \frac{Y}{Z}$$

$$Z' = 1$$

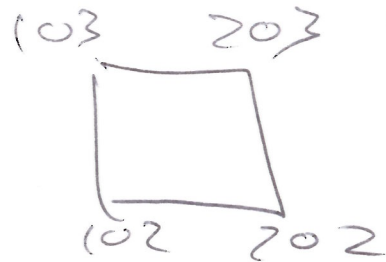


VIEW NORMALIZ. 3
CHANGE OBJECT THUS

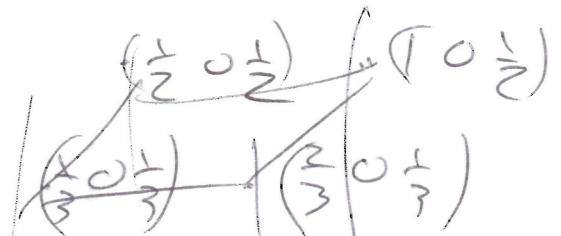
$$X' = \frac{X}{Z}$$

$$Y' = \frac{Y}{Z}$$

$$Z' = \frac{1}{Z}$$



→



PROJECT
 $Z=1$

