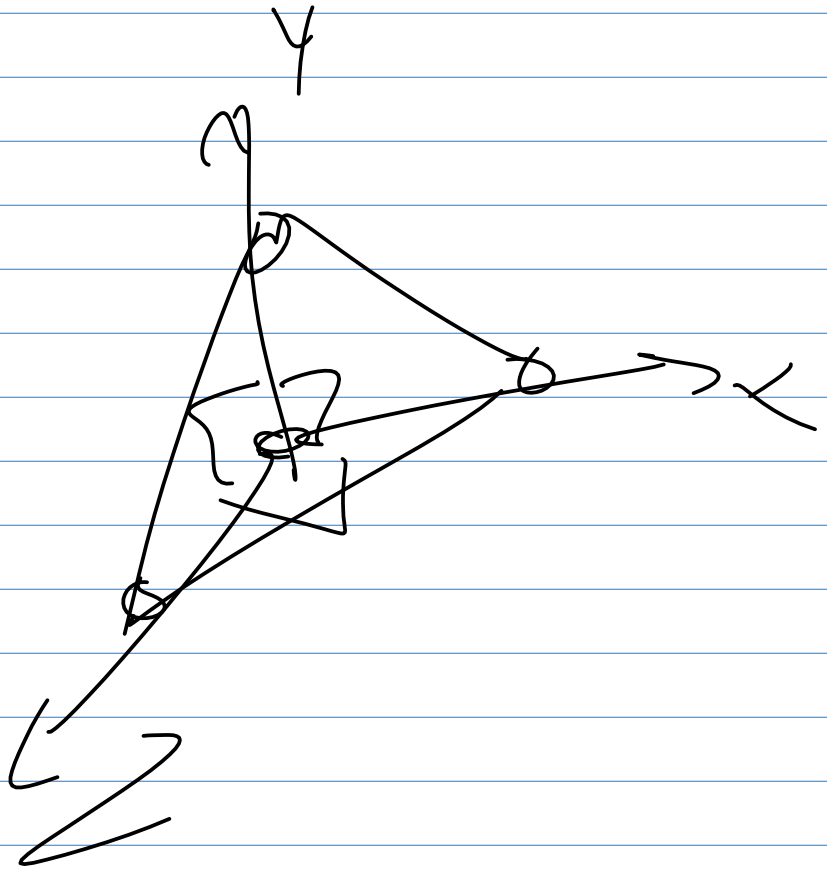
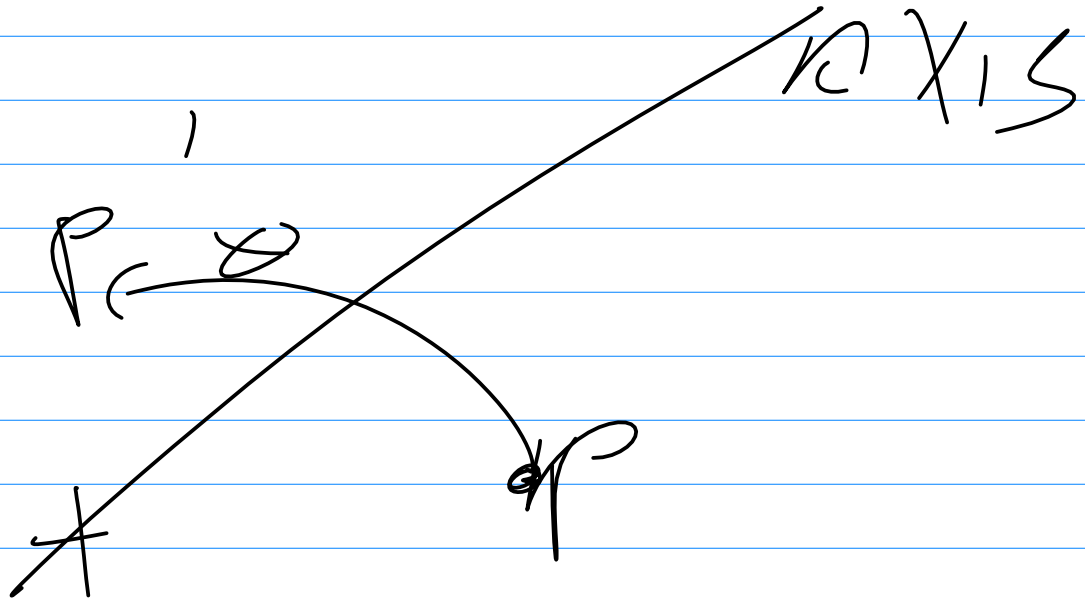
10/8/14 1





$$(a \cdot \rho)\, a\,(1-\cos\alpha)^2$$

$\rightarrow$ M ρ

$\uparrow$

depends on a, α

$$a = (1,2,3)$$

$$\rho = (1,2,1)$$

$$(a \cdot \rho)\, a = 8a = (8,16,24)$$

$$M = \begin{pmatrix} 1 & 2 & 3 \\ 2 & 4 & 6 \\ 3 & 6 & 9 \end{pmatrix} \qquad \begin{pmatrix} 1 \\ 2 \\ 1 \end{pmatrix} = \begin{pmatrix} 8 \\ 16 \\ 24 \end{pmatrix}$$

$q = (1,2,3)$ $\quad M = \begin{pmatrix} 1 & 2 & 3 \\ 2 & 4 & 6 \\ 3 & 6 & 9 \end{pmatrix}^3$

$p = (4,5,6)$

$(q \cdot p)\, q = 32q = (32, 64, 96)$

$$\begin{pmatrix} 1 & 2 & 3 \\ 2 & 4 & 6 \\ 3 & 6 & 9 \end{pmatrix} \begin{pmatrix} 4 \\ 5 \\ 6 \end{pmatrix} = \begin{pmatrix} 32 \\ 64 \\ 96 \end{pmatrix} \checkmark$$

4

$\theta = 180^\circ$

$\cos\frac{\theta}{2} = 0 \qquad \sin\frac{\theta}{2} = 1$

$a = (1, 0, 0)$

$q = 0 + 1\left(1 + 0J + 0K\right) = i$

$q^* = -i$

$p' = qpq^* = -ipi$

Point: $(1, 1, 1)$

$p = i + J + K$

$p' = -i(i + J + K)i$

$= -(-1 + K - J)i$

$= (1 - K + J)i$

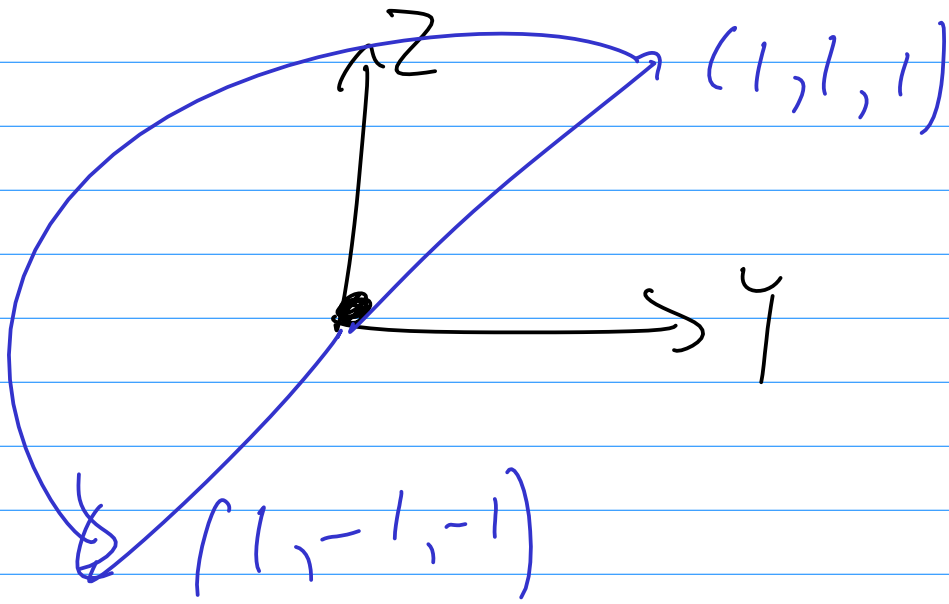
$= i - J - K \rightarrow (1, -1, -1)$

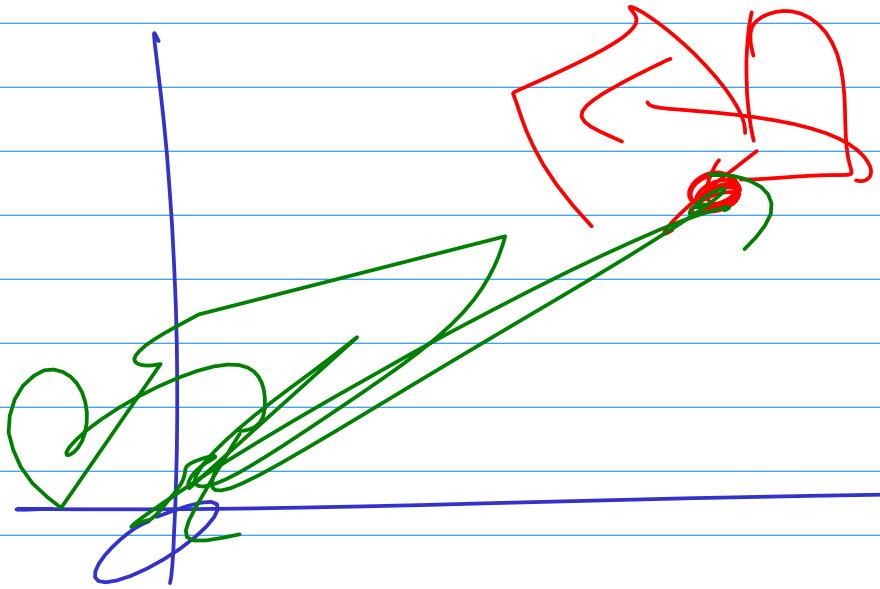
5

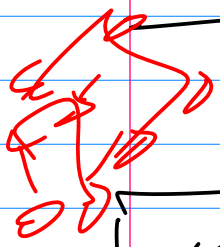
ROTATING $(1,1,1)$ BY

90° ABOUT y-AXIS

GIVES $(1,-1,-1)$







VERT → RASTERIZER ← FRAG

SHADER

SW

COLOR

$$\left(\begin{array}{c|c} \begin{matrix} 3\times 3 \\ \text{ROT} \end{matrix} & \begin{matrix} 0 \\ 0 \\ 0 \end{matrix} \\ \hline \text{SCALE} & \begin{matrix} 0 \\ 0 \\ 1 \end{matrix} \\ \hline \begin{matrix} 0 & 0 & 0 \end{matrix} & 1 \end{array}\right)$$

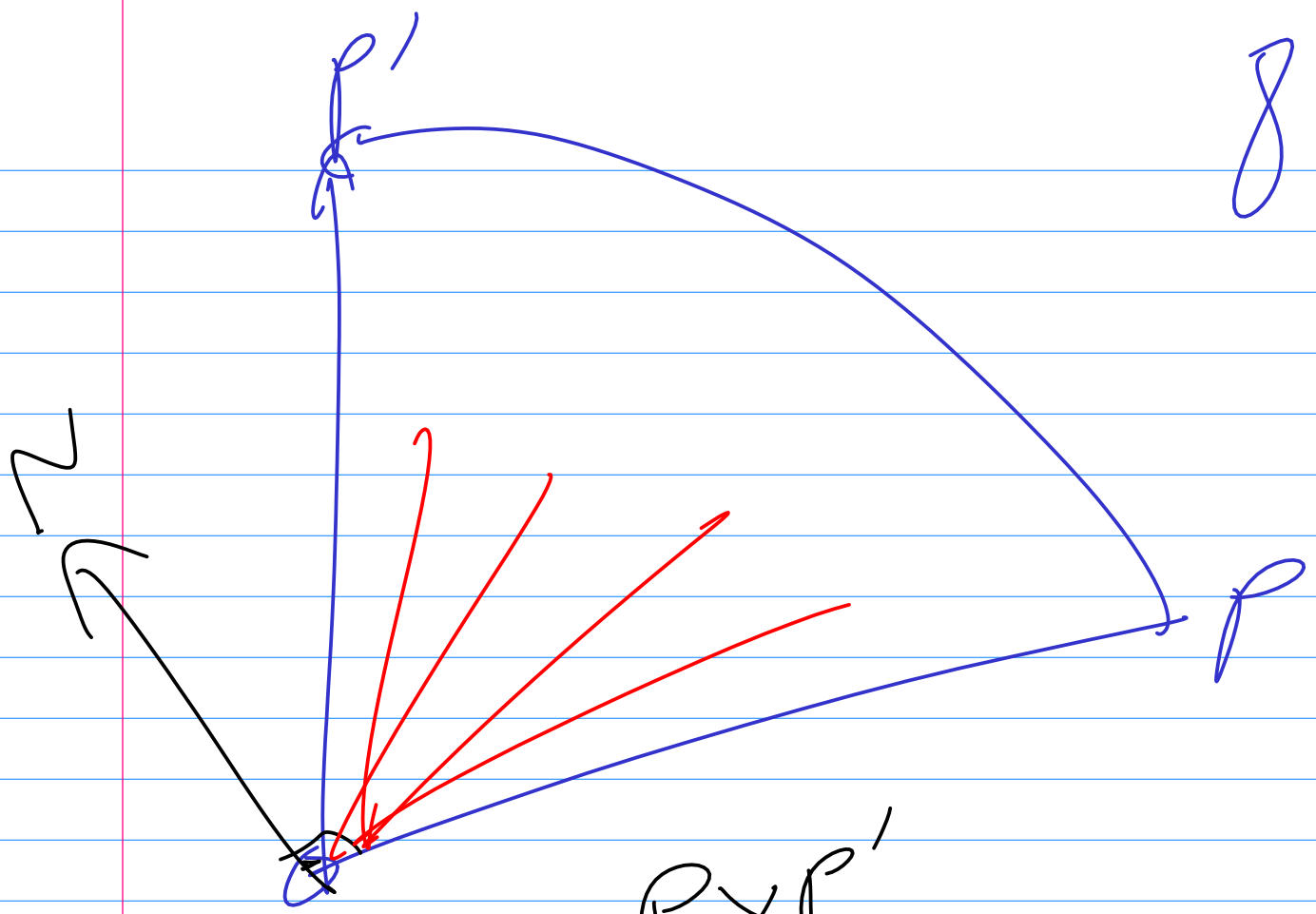
$$\begin{pmatrix} 0 & -1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix} \begin{pmatrix} \cos\theta & -\sin\theta & 0 \\ \sin\theta & \cos\theta & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

$$\theta = 90^\circ$$

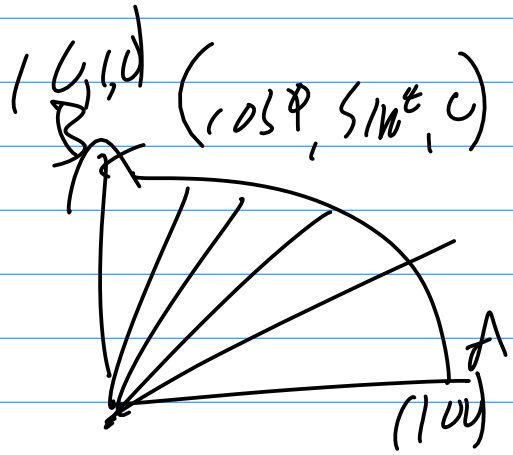
$$\cos\theta = 0$$

$$\sin\theta = 1$$

$$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix}$$



$$N = \frac{P \times P'}{|P \times P'|}$$



$$A = (1, 0, 0)$$

$$B = (0, 1, 0)$$

$$\alpha = 90^\circ \qquad A \cdot B = |A||B|\cos\theta$$

$$C = A\cos\theta + B\sin\theta$$

$$= (\cos\theta, \sin\theta, 0)$$

$$= (.7, .7, 0)$$

9

NOTHING FROM

OCT 2