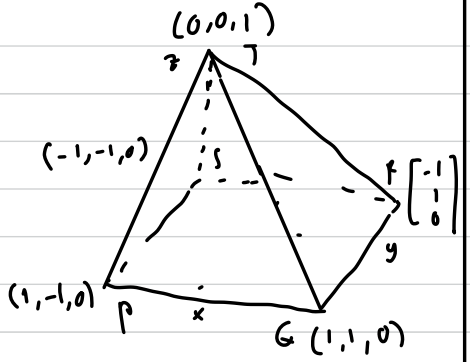
Soal TUM 2

Gornain Aji
21/481767/TK/53170

Soal 1

Kemungkinan titik puncaknya adalah titik (0,0,1)

Sehingga



a) $|\overline{PT}| = \left|\begin{bmatrix} -1 \\ 1 \\ 1 \end{bmatrix}\right| = \sqrt{(-1^2)+1^2+1^2}$

b) $|\overline{ST}| = \left|\begin{bmatrix} 0+1 \\ 0+1 \\ 1-0 \end{bmatrix}\right| = \sqrt{1^2+1^2+1^2} = \sqrt{3}$

c) $|\overline{RT}| = \left|\begin{bmatrix} 0+1 \\ 0-1 \\ 1-0 \end{bmatrix}\right| = \sqrt{1^2+(-1^2)+1^2} = \sqrt{3}$

d) $|\overline{QT}| = \left|\begin{bmatrix} 0-1 \\ 0-1 \\ 1-0 \end{bmatrix}\right| = \sqrt{(-1^2)+(-1^2)+1^2} = \sqrt{3}$

Setiap sisi dari piramida memiliki panjang $\sqrt{3}$

Soal 2

$u = \begin{bmatrix} 2 \\ 2 \end{bmatrix}$ $v = \begin{bmatrix} 2 \\ -2 \end{bmatrix}$ $w = \begin{bmatrix} -2 \\ -6 \end{bmatrix}$

1) a. Panjang $u = \|u\| = \sqrt{2^2+2^2} = 2\sqrt{2}$

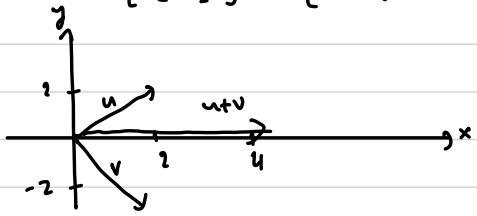
b. Panjang $v-w = \|v-w\| = \left\| \begin{bmatrix} 2+2 \\ -2+6 \end{bmatrix} \right\|$

$= \left\| \begin{bmatrix} 4 \\ 4 \end{bmatrix} \right\| = \sqrt{16+16} = \sqrt{32}$

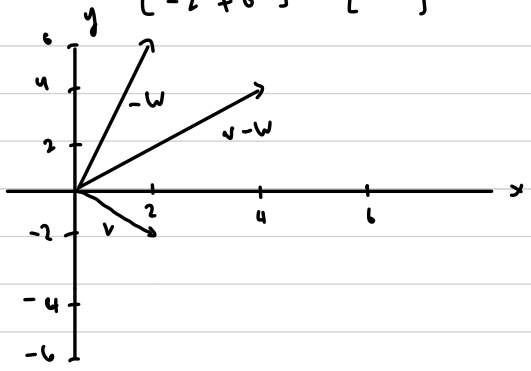
$= 4\sqrt{2}$

2) Hitung dan Gambar R^2 operasi vektor berikut

a) $u+v = \begin{bmatrix} 2+2 \\ 2-2 \end{bmatrix} = \begin{bmatrix} 4 \\ 0 \end{bmatrix}$



b) $v-w = \begin{bmatrix} 2+2 \\ -2+6 \end{bmatrix} = \begin{bmatrix} 4 \\ 4 \end{bmatrix}$



c) Sudut $(u-v)$ dan $(w+v)$

$u-v = \begin{bmatrix} 0 \\ 4 \end{bmatrix}$

$w+v = \begin{bmatrix} 0 \\ -8 \end{bmatrix}$

$\cos\theta = \dfrac{(u-v)\cdot(w+v)}{\|u-v\|\,\|w+v\|}$

$= \dfrac{(0)+(-32)}{(\sqrt{16})(\sqrt{64})} = \dfrac{-32}{4 \cdot 8} = -1$

$\cos\theta = -1$

$\theta = 180^\circ = \pi$