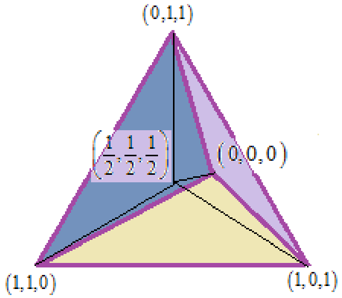
Step-1



Step-2

Let O = (0, 0, 0), B = (1, 1, 0), C= (1, 0, 1), D = (0, 1, 1) are the vertices and $E=\left(\frac{1}{2},\frac{1}{2},\frac{1}{2}\right)$ is center of the regular tetrahedron.

We determine the cosine of the angle θ between the rays from E to any to of above four vertices

Suppose $u = EA, v = EB$

$$\begin{aligned} u &= EA \\ &= OA - OE \\ &= (1,1,0)-\left(\frac{1}{2},\frac{1}{2},\frac{1}{2}\right) \\ &= \left(\frac{1}{2},\frac{1}{2},-\frac{1}{2}\right) \end{aligned}$$

Step-3

$$\begin{aligned} v &= EB \\ &= (1,0,1)-\left(\frac{1}{2},\frac{1}{2},\frac{1}{2}\right) \\ &= \left(\frac{1}{2},-\frac{1}{2},\frac{1}{2}\right) \end{aligned}$$

Angle between u and v is given by $\cos\theta = \frac{u^T v}{\|u\|\|v\|}$ â€¦â€¦ (1)

$$u^T v = \left(\frac{1}{2}, \frac{1}{2}, -\frac{1}{2}\right)\begin{pmatrix} 1/2 \\ -1/2 \\ 1/2 \end{pmatrix}$$
$$= \frac{1}{4} - \frac{1}{4} - \frac{1}{4}$$
$$= -\frac{1}{4}$$

Step-4

$$\|u\| = \sqrt{\left(\frac{1}{2}\right)^2 + \left(\frac{1}{2}\right)^2 + \left(-\frac{1}{2}\right)^2}$$
$$= \sqrt{\frac{1}{4} + \frac{1}{4} + \frac{1}{4}}$$
$$= \sqrt{\frac{3}{4}}$$

$$\|v\| = \sqrt{\left(\frac{1}{2}\right)^2 + \left(-\frac{1}{2}\right)^2 + \left(\frac{1}{2}\right)^2}$$
$$= \sqrt{\frac{1}{4} + \frac{1}{4} + \frac{1}{4}}$$
$$= \sqrt{\frac{3}{4}}$$

Step-5

Using all these results in (1), we get $\cos\theta = \frac{-1/4}{\sqrt{\frac{3}{4}}\sqrt{\frac{3}{4}}} = \frac{\left(-\frac{1}{4}\right)}{\frac{3}{4}} = \frac{-1}{3}$

Similarly, the angle between any two rays at E is $\boxed{\cos^{-1}\left(\pm\frac{1}{3}\right)}$