

Trigonometri – Nilai Trigonometri Sudut 22,5 dan 67,5

Menentukan nilai trigonometri sudut $22,5^\circ$ dan $67,5^\circ$.

Langkah-langkah:

1. Buat segitiga siku-siku sama kaki ABC, dengan $\angle C = 90^\circ$ dan $AC = BC$.
2. Perpanjang garis CB, shg $AB = BD$. Jadi segitiga ABD samakaki, akibatnya $\angle BAD = \angle BDA = 22,5^\circ$.
3. Ambil $AC = BC = 1$, maka $AB = BD = \sqrt{2}$, dan $BC = \sqrt{3}$, sehingga $CD = 1 + \sqrt{2}$.

Berdasar Pythagoras,

$$AD = \sqrt{AC^2 + CD^2} = \sqrt{1^2 + (1 + \sqrt{2})^2} = \sqrt{4 + 2\sqrt{2}}$$

Perhatikan segitiga ACD yang siku-siku di C, sesuai definisi diperoleh:

$$\sin 22,5^\circ = \sin D = \frac{AC}{AD} = \frac{1}{\sqrt{4 + 2\sqrt{2}}} = \frac{1}{2} \sqrt{2 - \sqrt{2}}$$

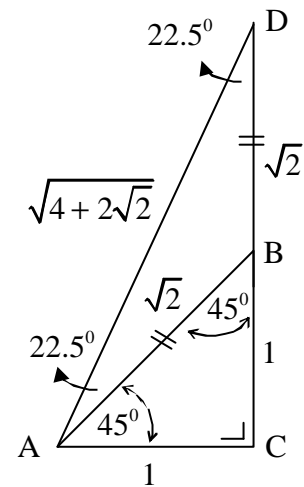
$$\cos 22,5^\circ = \cos D = \frac{CD}{AD} = \frac{1 + \sqrt{2}}{\sqrt{4 + 2\sqrt{2}}} = \frac{1}{2} \sqrt{2 + \sqrt{2}}$$

$$\tan 22,5^\circ = \tan D = \frac{AC}{CD} = \frac{1}{1 + \sqrt{2}} = \sqrt{2} - 1$$

$$\sin 67,5^\circ = \sin A = \frac{CD}{AD} = \frac{1 + \sqrt{2}}{\sqrt{4 + 2\sqrt{2}}} = \frac{1}{2} \sqrt{2 + \sqrt{2}}$$

$$\cos 67,5^\circ = \cos A = \frac{AC}{AD} = \frac{1}{\sqrt{4 + 2\sqrt{2}}} = \frac{1}{2} \sqrt{2 - \sqrt{2}}$$

$$\tan 67,5^\circ = \tan A = \frac{CD}{AC} = \frac{1 + \sqrt{2}}{1} = 1 + \sqrt{2}$$



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