

## Rumus Trigonometri Sudut Rangkap

Yang dimaksudkan sudut rangkap adalah  $2a$

Diketahui bahwa  $\sin(a + b) = \sin a \cos b + \cos a \sin b$ , maka:

$$\sin 2a = \sin(a + a) = \sin a \cos a + \cos a \sin a = \sin a \cos a + \sin a \cos a = 2 \sin a \cos a$$

$$\rightarrow \sin 2a = 2 \sin a \cos a$$

Diketahui bahwa  $\cos(a + b) = \cos a \cos b - \sin a \sin b$ , maka:

$$\cos 2a = \cos(a + a) = \cos a \cos a - \sin a \sin a = \cos^2 a - \sin^2 a$$

Diketahui  $\sin^2 a + \cos^2 a = 1$  atau  $\sin^2 a = 1 - \cos^2 a$  atau  $\cos^2 a = 1 - \sin^2 a$ , sehingga

$$\cos 2a = \cos^2 a - (1 - \cos^2 a) = \cos^2 a - 1 + \cos^2 a = 2 \cos^2 a - 1$$

$$\cos 2a = (1 - \sin^2 a) - \sin^2 a = 1 - \sin^2 a - \sin^2 a = 1 - 2 \sin^2 a$$

$$\begin{aligned} \rightarrow \cos 2a &= \cos^2 a - \sin^2 a \\ &= 2 \cos^2 a - 1 \\ &= 1 - 2 \sin^2 a \end{aligned}$$

Diketahui bahwa  $\tan(a + b) = \frac{\tan a + \tan b}{1 - \tan a \tan b}$ , maka:

$$\tan 2a = \tan(a + a) = \frac{\tan a + \tan a}{1 - \tan a \tan a} = \frac{2 \tan a}{1 - \tan^2 a}$$

$$\rightarrow \tan 2a = \frac{2 \tan a}{1 - \tan^2 a}$$