

## Rumus Jumlah Tangen

Diketahui bahwa rumus tan jumlah dan tan selisih adalah:

$$\tan(A + B) = \frac{\tan A + \tan B}{1 - \tan A \tan B} \quad \text{dan}$$

$$\tan(A - B) = \frac{\tan A - \tan B}{1 + \tan A \tan B}$$

misalkan,  $A + B = x$  dan  $A - B = y$ , maka

$$A + B = x$$

$$A + B = x$$

$$\frac{A - B = y}{2A = x + y} + \quad \text{dan} \quad \frac{A - B = y}{2B = x - y} -$$

$$A = \frac{1}{2}(x + y)$$

$$B = \frac{1}{2}(x - y)$$

dengan demikian:

$$\begin{aligned} & \tan(A + B) + \tan(A - B) \\ &= \frac{\tan A + \tan B}{1 - \tan A \tan B} + \frac{\tan A - \tan B}{1 + \tan A \tan B} \\ &= \frac{(\tan A + \tan B)(1 + \tan A \tan B) + (\tan A - \tan B)(1 - \tan A \tan B)}{(1 - \tan A \tan B)(1 + \tan A \tan B)} \\ &= \frac{2\tan A + 2\tan A \tan^2 B}{1 - \tan^2 A \tan^2 B} \\ &= \frac{2\tan A (1 + \tan^2 B)}{1 - \tan^2 A \tan^2 B} \end{aligned}$$

sehingga,

$$\tan x + \tan y = \frac{2\tan \frac{1}{2}(x + y) \left( 1 + \tan^2 \frac{1}{2}(x - y) \right)}{1 - \tan^2 \frac{1}{2}(x + y) \tan^2 \frac{1}{2}(x - y)}$$

