

Rumus Jumlah Sinus

Dari persamaan berikut:

$$\sin a \cos b = \frac{1}{2} \sin(a + b) + \frac{1}{2} \sin(a - b)$$

$$\cos a \sin b = \frac{1}{2} \sin(a + b) - \frac{1}{2} \sin(a - b)$$

Misalkan $a + b = P$ dan $a - b = Q$ maka

$$\begin{array}{l} a + b = P \\ a - b = Q \end{array} \quad + \quad \text{dan} \quad \begin{array}{l} a + b = P \\ a - b = Q \end{array} \quad -$$

$$\frac{2a = P + Q}{a = \frac{1}{2}(P + Q)} \quad \text{dan} \quad \frac{2b = P - Q}{b = \frac{1}{2}(P - Q)}$$

Substitusi ke persamaan di atas, diperoleh:

$$\sin a \cos b = \frac{1}{2} \sin(a + b) + \frac{1}{2} \sin(a - b)$$

$$\Rightarrow \sin \frac{1}{2}(P + Q) \cos \frac{1}{2}(P - Q) = \frac{1}{2} \sin P + \frac{1}{2} \sin Q$$

$$\Rightarrow 2 \sin \frac{1}{2}(P + Q) \cos \frac{1}{2}(P - Q) = \sin P + \sin Q$$

$$\rightarrow \sin P + \sin Q = 2 \sin \frac{1}{2}(P + Q) \cos \frac{1}{2}(P - Q)$$

$$\cos a \sin b = \frac{1}{2} \sin(a + b) - \frac{1}{2} \sin(a - b)$$

$$\Rightarrow \cos \frac{1}{2}(P + Q) \sin \frac{1}{2}(P - Q) = \frac{1}{2} \sin P - \frac{1}{2} \sin Q$$

$$\Rightarrow 2 \cos \frac{1}{2}(P + Q) \sin \frac{1}{2}(P - Q) = \sin P - \sin Q$$

$$\rightarrow \sin P - \sin Q = 2 \cos \frac{1}{2}(P + Q) \sin \frac{1}{2}(P - Q)$$

