

Rumus Jumlah Cosinus

Dari persamaan berikut:

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

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

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:

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

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

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

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

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

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

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

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

