RUMUS SUDUT RANGKAP TIGA (3A)

$$\begin{aligned}\sin 3A &= \sin(2A+A)\\ &= \sin 2A\cos A+\cos 2A\sin A\\ &= (2\sin A\cos A)\cos A+(1-2\sin^2 A)\sin A\\ &= 2\sin A\cos^2 A+\sin A-2\sin^3 A\\ &= 2\sin A(1-\sin^2 A)+\sin A-2\sin^3 A\\ &= 2\sin A-2\sin^3 A+\sin A-2\sin^3 A\\ &= 3\sin A-4\sin^3 A\end{aligned}$$

$$\begin{aligned}\cos 3A &= \cos(2A+A)\\ &= \cos 2A\cos A-\sin 2A\sin A\\ &= (2\cos^2 A-1)\cos A-(2\sin A\cos A)\sin A\\ &= 2\cos^3 A-\cos A-2\cos A\sin^2 A\\ &= 2\cos^3 A-\cos A-2\cos A(1-\cos^2 A)\\ &= 2\cos^3 A-\cos A-2\cos A+2\cos^3 A\\ &= 4\cos^3 A-3\cos A\end{aligned}$$

$$\begin{aligned}\tan 3A &= \tan(2A+A)\\ &= \frac{\tan 2A+\tan A}{1-\tan 2A\tan A}\\ &= \frac{\dfrac{2\tan A}{1-\tan^2 A}+\dfrac{(1-\tan^2 A)\tan A}{1-\tan^2 A}}{1-\dfrac{2\tan A}{1-\tan^2 A}\tan A}\\ &= \frac{\dfrac{2\tan A+\tan A-\tan^3 A}{1-\tan^2 A}}{\dfrac{1-\tan^2 A}{1-\tan^2 A}-\dfrac{2\tan^2 A}{1-\tan^2 A}}\\ &= \frac{\dfrac{3\tan A-\tan^3 A}{1-\tan^2 A}}{\dfrac{1-\tan^2 A-2\tan^2 A}{1-\tan^2 A}}\\ &= \frac{3\tan A-\tan^3 A}{1-3\tan^2 A}\end{aligned}$$

Jadi diperoleh:

$$\sin 3A = 3\sin A-4\sin^3 A$$
$$\cos 3A = 4\cos^3 A-3\cos A$$
$$\tan 3A = \frac{3\tan A-\tan^3 A}{1-3\tan^2 A}$$