PERTEMUAN 14

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INTEGRAL TEKNIK SUBTITUSI 2 (lanjutan)

- **Strategi** **untuk** **menghitung:** $\int[\sin\ mx\ \cos\ nx\ ]dx,$

$\int[\cos\ mx\ \cos\ nx\ ]dx$, dan $\int[\sin\ mx\ \sin\ nx\ ]dx$

Formula :

a) $\sin A\cos B = \dfrac{1}{2}\left[\sin\ (A+B) + \sin\ (A-B)\right]$

b) $\cos A\cos B = \dfrac{1}{2}\left[\cos\ (A+B) + \cos\ (A-B)\right]$

c) $\sin A\sin B = \dfrac{1}{2}\left[-\cos\ (A+B) + \cos\ (A-B)\right]$

1. $\int \sin 2x\cos 3x\ dx = \dfrac{1}{2}\int[\sin(2+3)\,x + \sin(2-3)x]\ dx$

$= \dfrac{1}{2}\int[\sin 5\,x + \sin(-x)]dx$

$= \dfrac{1}{2}\int[\sin 5\,x + \sin(-x)]dx$

$= \dfrac{1}{2}\left[-\dfrac{1}{5}\cos 5x + \cos(-x) + C\right]$

$= -\dfrac{1}{10}\cos 5x + \dfrac{1}{2}\cos(-x) + \dfrac{1}{2}C$

2. $\int \sin 2x\sin 4x\ dx = -\dfrac{1}{2}\int[\cos (2+4)\,x - \cos (2-4)x]\ dx$

$= -\dfrac{1}{2}\int[\cos 6\,x - \cos (-2x)]dx$

$= -\dfrac{1}{2}\int[\cos 6\,x - \cos (-2x)]dx$

$= -\dfrac{1}{2}\left[\dfrac{1}{6}\sin 6x - \sin (-2x) + C\right]$

$= -\dfrac{1}{12}\sin 2x - \dfrac{1}{4}\sin(-2x) - \dfrac{1}{2}C$

3. $\int \cos 3x \cos x \, dx = \frac{1}{2} \int [\cos(3+1)x + \cos(3-1)x] \, dx$

$= \frac{1}{2} \int [\cos 4x + \cos(2x)] dx$

$= \frac{1}{2} \int [\cos 4x + \cos(2x)] dx$

$= \frac{1}{2} \left[\frac{1}{4} \sin 4x + \frac{1}{2} \sin(2x) + C \right]$

$= \frac{1}{8} \sin 4x + \frac{1}{4} \sin(2x) + \frac{1}{2} C$

Soal Latihan

1) $\int\left[\cos^3 x \sin^2 x\right] dx$

2) $\int\left[\sin^5 x \cos^2 x\right] dx$

3) $\int \cos^3 x dx$

4) $\int \sin^4 x dx$

5) $\int\left[\sin^3 x \sqrt{\cos x}\right] dx$

6) $\int\left[\sin^3 x \cos^5 x\right] dx$

7) $\int\left[\sin^4 x \cos^2 x\right] dx$

8) $\int\left[\cos^3 x \sin^{\frac{5}{2}} x\right] dx$

9) $\int\left[\sin^2 x \cos^2 x\right] dx$

10) $\int \sin^3 5x \ dx$

11) $\int\left[\tan^6 x \sec^4 x\right] dx$

12) $\int\left[\tan^5 x \sec^7 x\right] dx$

13) $\int\left[\tan^5 x \sec^6 x\right] dx$

14) $\int\left[\tan^2 x \sec x\right] dx$

15) $\int \tan^3 x dx$

16) $\int\left[\cot^2 x \csc^4 x\right] dx$

17) $\int\left[\cot^3 x \csc^5 x\right] dx$

18) $\int\left[\cot^3 x \csc^4 x\right] dx$

19) $\int\left[\cot^2 x \csc x\right] dx$

20) $\int \cot^4 x dx$

21) $\int\left[\sin 5x \sin 2x\right] dx$

22) $\int\left[\sin 3x \cos 2x\right] dx$

23) $\int\left[\cos 7x \cos 4x\right] dx$

24) $\int\left[\cos 5x \cos 12x\right] dx$

25) $\int\left[\cos 8x \sin 4x\right] dx$