90pts

Corto #3 Cálculo Integral (20 min)

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Resuelva las siguientes integrales:

1. (50 pts.) $\int \tan^5\theta \sec^4\theta \, d\theta$

$= \int \tan^5\theta \cdot \sec^2\theta \left(\tan^2\theta + 1\right) d\theta$

$= \int \tan^7\theta \sec^2\theta + \int \tan^5 \sec^2\theta$

$u = \tan\theta$ $\quad du = \sec^2\theta$

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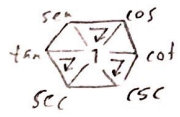

$\sin^2 x + \cos^2 x = 1$

$\tan^2 x + 1 = \sec^2 x$

$\sin^2 x = \frac{1}{2}\left(1 - \cos(2x)\right)$

$\tan^2 x = \sec^2 x - 1$

$\therefore = \int u^7 du + \int u^5 du$

$= \frac{u^8}{8} + \frac{u^5}{5} + C$

$= \frac{\tan^8\theta}{8} + \frac{\tan^5\theta}{5} + C$ ✗ 40pts

2. (50 pts.) $\int e^{x^8+1}(x^8+1)16x^7 \, dx$

$u = x^8 + 1$

$du = 8x^7 \, dx$

$2(du) = 16x^7 \, dx$

$= 2\int e^u (u) \, du$

$u = u \quad dv = e^u$

$du = 1\,du \quad v = e^u$

$\int u\,dv = uv - \int v\,du$

$u \cdot e^u - \int e^u \, du$

$u \cdot e^u - e^u + C$

$2\left[(x^8+1)(e^{x^8+1}) - (e^{x^8+1}) + C\right]$

$2\left[(x^8+1)\left(e^{x^8+1}\right) - \left(e^{x^8+1}\right) + C\right]$ ✓

$\frac{d}{dx}\left[2(x^8+1)e^{x^8+1} - 2e^{x^8+1}\right]$

$2x^8 + 2 + 2e^{x^8+1} - 2e^{x^8+1}$

$2x^8 + 2$

50pts