Math 2414: Calculus II

Homework

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1. Evaluate
$$\int x^5 e^{4x} dx$$

2. Evaluate
$$\int \cos 2x \ e^{3x} dx$$

3. Evaluate
$$\int x^6 \cos 4x \, dx$$

4. Evaluate
$$\int \cos(\ln x) \ dx$$

5. Evaluate
$$\int_0^{\pi} e^{\cos t} \sin 2t \ dt$$

1.
$$e^{4x} \left(\frac{1}{4}x^5 - \frac{5}{16}x^4 + \frac{5}{16}x^3 - \frac{15}{64}x^2 + \frac{15}{128}x - \frac{15}{512} \right)$$

2.
$$\frac{4}{13}e^{3x}\left(\frac{1}{2}\sin 2x + \frac{3}{4}\cos 2x\right) + C$$

3.
$$\left(\frac{1}{4}x^6 - \frac{15}{32}x^4 + \frac{45}{128}x^2 - \frac{45}{1,024}\right)\sin 4x + \left(\frac{3}{8}x^5 - \frac{15}{32}x^3 + \frac{45}{256}x\right)\cos 4x + C$$

4.
$$\frac{1}{2}x(\cos(\ln x) + \sin(\ln x)) + C$$

5.
$$\frac{4}{e}$$