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I. Solve the following integrals. SHOW THE STEPS OF YOUR PROCEDURE. (20 points each)

1. $\int \sin^3(2x) dx$

$$\int \sin^2(2x) \sin(2x)$$

$$\int (1 - \cos^2(2x)) \sin(2x)$$

$$\int \sin(2x) - \cos^2(2x) \sin(2x)$$

$$= -\frac{1}{2} \cos(2x) - \frac{1}{2} \frac{\cos^3(2x)}{3} + C$$

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2. $\int x^6 \cos^2(x^7) dx$

$$\frac{1}{2} \int x^6 (1 - \cos(2x^7))$$

$$\frac{1}{2} \int x^6 - x^6 \cos(2x^7) \quad \begin{matrix} u = 2x^7 \\ du = 14x^6 \end{matrix}$$

$$\frac{1}{2} \left[\frac{x^7}{7} - \frac{1}{14} \sin(2x^7) \right] + C$$

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3. $\int 9x^4 \tan^3(x^5) dx$

$$\int 9x^4 (\sec^2(x^5) - 1) \tan(x^5) \quad \begin{matrix} u = x^5 \\ du = 5x^4 \end{matrix}$$

$$\int 9x^4 \sec^2(x^5) - 9x^4$$

$$= \frac{9}{5} \tan(x^5) - \frac{9x^5}{5} + C$$

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