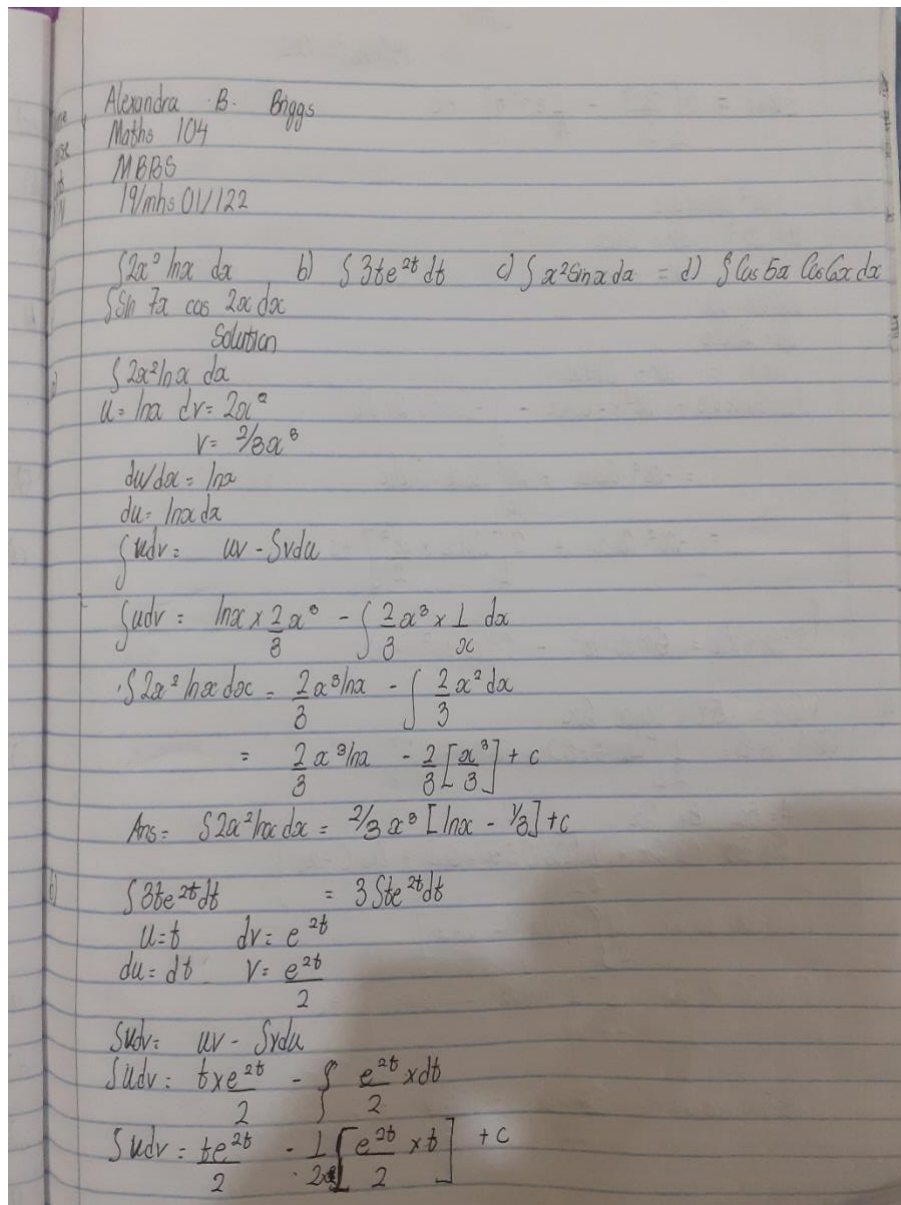


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$$\int u dv = 3 \left[\frac{e^{2t}}{2} - \frac{1}{4} e^{2t} t \right] + C$$

3) $\int x^2 \sin x dx$

$u = x^2 \quad dv = \sin x$

$v = -\cos x$

$du/dx = 2x$

$du = 2x dx$

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

$$\int x^2 \sin x dx = x^2 \cdot (-\cos x) - \int (-\cos x) \cdot 2x dx$$

$$= -x^2 \cos x + 2 \int \cos x \cdot x dx$$

$$= -x^2 \cos x + 2 \left[\sin x \cdot x - \frac{x^2}{2} \right] + C$$

$$\int x^2 \sin x dx = \sin x \cdot x^2 - \cos x \cdot x^2 + C$$

4) $\int \cos x \cdot 5x \cdot \cos x \cdot 6x$

$$\cos A \cdot \cos B = \frac{1}{2} [\cos(A+B) + \cos(A-B)]$$

$A = 5x \quad B = 6x$

$$\int \cos 5x \cdot \cos 6x = \frac{1}{2} [\cos(5x+6x) + \cos(5x-6x)]$$

$$\int \cos 5x \cdot \cos 6x = \frac{1}{2} [\cos 11x + \cos(-x)]$$

$$\int \cos 5x \cdot \cos 6x = \frac{1}{2} \left[\frac{1}{11} \sin 11x - \sin x \right] + C$$

$$\int \cos 5x \cdot \cos 6x = \frac{\sin 11x}{22} - \frac{\sin x}{2} + C$$

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$$\int \sin 7x \cos 2x \, dx =$$

$$\sin A \cos B = \frac{1}{2} [\sin(A+B) + \sin(A-B)]$$

$$\sin(A+B) = \sin(9x) \quad \sin(A-B) = \sin(5x)$$

$$\int \sin 7x \cos 2x \, dx = \frac{1}{2} [\sin(9x) + \sin(5x)]$$

$$\int \sin 7x \cos 2x = \frac{1}{2} [-\cos 9x - \cos 5x]$$

$$\int \sin 7x \cdot \cos 2x = -\frac{\cos 9x}{18} - \frac{\cos 5x}{10} + c$$

