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Analytical Methods (ACHA4000)

iv) $\int_2^4 (2x+3)(x+5) dx$

$$= \int_2^4 2x^2 + 13x + 15 dx$$

$$= \int_2^4 2x^2 dx + \int_2^4 13x dx + \int_2^4 15 dx$$

$$= \frac{112}{3} + 78 + 30$$

$$= \frac{436}{3} = 145.33$$

b) i) $\int 4x \cos 3x dx$

$$= 4x \int x \cos(3x) dx$$

$$= 4 \times \int \frac{u \cos(u)}{9} du$$

$$= 4 \times \frac{1}{9} \times \int u \cos(u) du$$

$$= 4 \times \frac{1}{9} (u \sin(u) - (-\cos(u)))$$

$$= \frac{4}{9} (3x \sin(3x) + \cos(3x))$$

$$= \frac{4}{9} (3x \sin(3x) + \cos(3x)) + C$$
