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maths friday afternoons Exam 2 11/12/20

iii) $\int_2^5 (x+2)^3 + x - 1 \, dx.$

Sum rule

$$\int_2^5 (x+2)^3 \, dx + \int_2^5 x \, dx - \int_2^5 1 \, dx$$

$$\int_2^5 (x+2)^3 \, dx \quad \underline{\underline{\frac{2145}{4}}}$$

$$\int_2^5 x \, dx = \frac{21}{2}$$

$$\int_2^5 1 \, dx = 3 \quad = \frac{2145}{4} + \frac{21}{2} - 3 = \underline{\underline{\frac{2175}{4}}}$$

b) $\int x \sin 4x \, dx$

$$u = x \quad v = \sin 4x$$

$$\int = -\frac{1}{4} x \cos(4x) - \int -\frac{1}{4} \cos(4x) \, dx$$

$$\int -\frac{1}{4} \cos(4x) \, dx = -\frac{1}{16} \sin(4x)$$

$$= -\frac{1}{4} x \cos(4x) - \left(-\frac{1}{16} \sin(4x)\right)$$

$$= -\frac{1}{4} x \cos(4x) + \frac{1}{16} \sin(4x)$$

$$= -\frac{1}{4} x \cos(4x) + \frac{1}{16} \sin(4x) + C$$