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Question 2: integration

a) (i) $\int (x^2 - 6x)(3x^2 - x) dx$

$$\therefore \int 3x^4 - 18x^3 - 5x^3 + 6x^2 dx$$

$$\therefore \int 3x^4 + 5x^2 - 18x^3 dx$$

$$\therefore = \frac{3x^5}{5} + \frac{5x^3}{3} - \frac{18x^4}{4} + c$$

(ii) $\int (x^2 + 3x)^2 + e^{0.5x} - \sin 2x dx$

$$\therefore \int (x^2 + 3x)(x^2 + 3x) + e^{0.5x} - \sin 2x dx$$

$$\therefore \int x^4 + 3x^3 + 3x^3 + 9x^2 + e^{0.5x} - \sin 2x dx$$

$$\therefore \int x^4 + 6x^3 + 9x^2 + e^{0.5x} - \sin 2x dx$$

$$\therefore = \frac{x^5}{5} + \frac{6x^4}{4} + \frac{9x^3}{3} + 2e^{0.5x} - \frac{1}{2} \cos 2x + c$$

(iii) $\int_0^3 (2x^2 + 3)^3 dx$

$$\therefore \int_0^3 (2x^2 + 3)(2x^2 + 3)(2x^2 + 3) dx$$

$$\therefore \int_0^3 (4x^4 + 6x^2 + 6x^2 + 9)(2x^2 + 3) dx$$

$$\therefore \int_0^3 (4x^4 + 12x^2 + 9)(2x^2 + 3) dx$$

$$\therefore \int_0^3 (8x^6 + 12x^4 + 24x^4 + 36x^2 + 18x^2 + 27) dx$$

$$\therefore \int_0^3 (8x^6 + 36x^4 + 54x^2 + 27) dx$$

$$\therefore \int (8(3)^6 + 36(3)^4 + 54(3)^2 + 27) - (0)$$

$$= \frac{8x^7}{7} + \frac{36x^5}{5} + \frac{54x^3}{3} + \frac{27x}{1}$$

continued on following

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