

i) $\int x^4 + 3x^2 - 7x + 1 \, dx$

$$\int \frac{x^4}{5} + \frac{3x^2}{2} - \frac{7x^1}{1} + x + C$$

$$= \frac{x^5}{5} + x^3 - 1.5x^2 + x + C$$

ii) $\int (x-1)(x-3) \, dx$

$$\int x^2 - 3x - x + 3 \, dx$$

$$\int x^2 - 4x + 3 \, dx$$

$$= \frac{x^3}{3} - \frac{4x^2}{2} + 3x + C$$

iii)

$$\int 3 \sec^2 2x \, dx$$

$$2 \int \sec^2 2x \, dx$$

$$\int 2x^{\frac{1}{2}} \ln 3x + C$$

$$2 \cdot \frac{2}{3} \ln 3x + C$$

10) $\int_0^4 (x+3)(x+2) \, dx$

$$\int_0^4 x^2 + 2x + 3x + 6 \, dx$$

$$\int_0^4 x^2 + 5x + 6 \, dx$$

$$\left[\frac{x^3}{3} + \frac{5x^2}{2} + 6x + C \right]_0^4$$

$$\left[\frac{6^3}{3} + 5 \left(\frac{4^2}{2} \right) + 6(4) + 0C \right]$$

$$= 41.67 + 40 + 24 + C$$

$$= 105.67$$