

(Q2)

$$n) \quad 1) \quad \int \frac{2x}{(4+3x^2)} dx \rightarrow \int 2x(4+3x^2)^{-1} dx$$

$$\text{Int. by parts} \quad \int u \frac{dv}{dx} = uv - \int \frac{du}{dx} v$$

$$u = 2x \quad \frac{dv}{dx} = (4+3x^2)^{-1}$$

$$\frac{du}{dx} = 2 \quad v = \ln(4+3x^2)$$

$$= 2x \cdot \ln(4+3x^2) - \int 2 \cdot \ln(4+3x^2)$$

$$- 2 \int \ln(4+3x^2)$$

$$- 2 \cdot (4+3x^2) \ln(4+3x^2) - (4+3x^2) + C$$

$$= 2x \ln(4+3x^2) - 2(4+3x^2) \ln(4+3x^2) + (4+3x^2) + C$$

$$11) \quad \int_0^4 e^{\frac{1}{2}x} dx$$

$$\left[2e^{\frac{1}{2}x} \right]_0^4 \quad (2e^{\frac{1}{2}(4)} + C) - (2e^{\frac{1}{2}(0)} + C)$$

$$= 2e^2 - 2e^0 = 2e^2 - 2 = 12.778$$

$$111) \quad \int_0^4 \frac{5x+13}{(2x+1)(x+4)} dx \rightarrow \int \frac{A}{2x+1} + \frac{B}{x+4} dx$$

$$5x+13 = A(x+4) + B(2x+1)$$

$$x = -4 \quad x = -\frac{1}{2}$$

$$5(-4)+13 = B(2(-4)+1) \quad 5(-\frac{1}{2})+13 = A(-\frac{1}{2}+4)$$

$$-7 = B(-7)$$

$$\frac{21}{2} = A(\frac{7}{2})$$

$$-1 = B$$

$$3 = A$$