

Q2

$$a) \int \frac{2x}{(4+3x^2)} dx = \int (2x)/(4+(3x^2)) dx \rightarrow \frac{1}{3} \ln(3x^2+4) + C$$

$$2 \int \frac{x}{3x^2+4} \rightarrow \frac{1}{3} \int \frac{1}{u} du \quad \begin{matrix} [u=3x^2+4] \\ [du=6x dx] \end{matrix}$$

$$\frac{\ln(u)}{3} + C$$

B)

$$\int_0^4 (e^{0.5x}) dx \rightarrow [u = \frac{x}{2} \quad du = \frac{1}{2} dx]$$

$$2 \int_0^2 e^u du$$

$$2e^u \Big|_0^2$$

$$2(e^2 - 1)$$

$$\boxed{12.7781} \quad (\text{if feels hard...})$$

$$c) \int_0^4 \frac{5x+13}{(2x+1)(x+4)} dx = ((5x+13)/((2x+1)(x+4))) dx$$

$$\left[\begin{matrix} u=2x+1 \\ du=2dx \end{matrix} \right] \leftarrow 3 \int \frac{1}{2x+1} dx + \int_0^4 \frac{1}{x+4} dx$$

$$\frac{3}{2} \int_1^9 \frac{1}{u} du + \int_0^4 \frac{1}{x+4} dx \rightarrow \frac{3 \log(u)}{2} \Big|_1^9 + \int_0^4 \frac{1}{x+4} dx \rightarrow \left[\begin{matrix} s=x+4 \\ ds=dx \end{matrix} \right] \rightarrow \int_4^8 \frac{1}{s} ds$$

$$(3.1p) \\ 3.91p \approx$$

$$\boxed{\log(54)}$$

$$\log(27)$$

$$+ \log(2) \leftarrow \log(8) \Big|_4^8 \leftarrow \log(1)$$