

$$Q2) \text{ c) (ii) } \int_1^e \ln x \, dx$$

$$\left[x(\ln x - 1) \right]_1^e$$

$$(e(\ln e - 1)) - (1(\ln 1 - 1))$$

$$= e(1 - 1) - (0 - 1)$$

$$= \underline{\underline{+1}}$$

$$Q3) \text{ a) (i) } \left(\frac{1+i}{1-i} \right)^3$$

$$\frac{(1+i)(1+i)(1+i)}{(1-i)(1-i)(1-i)}$$

$$= \frac{-j^3 - 3i^2 - 3i - 1}{i^3 - 3i^2 - 3i - 1}$$

$$= \frac{i + 3 - 3i - 1}{-i + 3 - 3i - 1}$$

$$= \frac{+2i + 2}{+2i + 2}$$

$$\underline{\underline{1 + i}}$$

$$\underline{\underline{= 0 - 1i}}$$