

(b) let

$$I_n = \int_0^1 e^{2x} (1-x)^n dx, \text{ for } n = 0, 1, 2, \dots$$

1) Evaluate I_0 .

2) Show that a reduction formula for

I_n is

$$I_n = \frac{1}{2} (n I_{n-1} - \frac{1}{2})$$

For $n \geq 1$

3. Deduce the values of I_1 and I_2