JENNI'S SOLUTIONS

Evaluate $\int_1^2 (e^x + e^{-x})\,dx.$

SOLUTION

$$\int_1^2 (e^x + e^{-x})\,dx = [e^x - e^{-x}]_1^2$$

$$= \{(e^2 - e^{-2}) - (e^1 - e^{-1})\}$$

$$= e^2 - e + \tfrac{1}{e} - \tfrac{1}{e^2}$$

LIMITS OF INTEGRATION

The limits are the little numbers at the top and bottom of the integral. Be very careful when evaluating integrals. Follow the method outlined exactly. It is so easy to make a mistake by getting a sign wrong.

Ex. Evaluate $\int_{-1}^2 (2x + 3)\,dx.$

SOLUTION

$$I = \int_{-1}^2 (2x + 3)\,dx = [x^2 + 3x]_{-1}^2$$

[Carry out the integration. Put your answer in square brackets with the limits outside the bracket.]

$$= \{(2)^2 + 3(2)\} - \{(-1)^2 + 3(-1)\}$$

$$= \{(10) - (-2)\} = 12$$

[Put in two curly brackets with a minus between them. Substitute the top limit for x in the first bracket and the bottom limit for x in the second bracket.]

Exponential Integration

$$\boxed{\int e^x\,dx = e^x + c}$$ **3**

Formula 3 can be extended to:

$$\boxed{\int e^{ax+b}\,dx = \tfrac{1}{a}e^{ax+b} + c}$$ **3**