**Solutions - Section 38**

(2a) Evaluate the integral

$$\int_1^2 \left(\frac{1}{t} - i\right)^2 dt$$

(2b) Evaluate the integral

$$\int_0^{\frac{\pi}{6}} e^{i2t} dt$$

(3) Show that if $m$ and $n$ are integers, then the integral

$$\int_0^{2\pi} e^{im\theta} e^{-in\theta}\, d\theta$$

is 0 if $m \neq n$ and $2\pi$ if $m = n$.