

$$= \sum_{\substack{k=0,2 \\ \text{even}}} (i\theta A)^k \frac{1}{k!} + i \sum_{\substack{k=1,3 \\ \text{odd}}} i^{k-1} \frac{(\theta A)^k}{k!}$$

$$= \left(I - \frac{I\theta^2}{2!} + \frac{I\theta^4}{4!} \dots \right) + i \left(A \left(I\theta - \frac{I\theta^3}{3!} \dots \right) \right)$$

$$= \cos \theta I + i \sin \theta A \quad \text{(using expansion formulae of sine & cosine).}$$