## **Trigonometry and Matrices**

Function of a complex variable

If 
$$i^{ii}-\cdots = A+iB$$
 and only principal values are Considered frove that

(i)  $\frac{17A}{2} = \frac{B}{A}$ 

(ii) 
$$A^2 + B^2 = e^{-\eta B}$$

$$i^{1} = A + iB$$

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$$A + iB = i^{1} + iB$$

$$= e^{(A+iB)} \log (\cos \pi |_{2} + i \sin \pi |_{2})$$

$$= e^{(A+iB)} \log e^{i\pi |_{2}}$$

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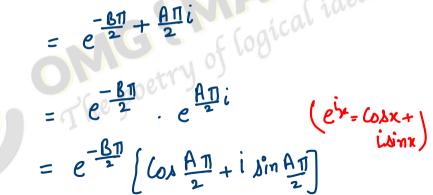
$$= e^{(A+iB)} i \pi i 2$$

$$= e^{\frac{Ai\pi}{2}} + i^{\frac{2}{2}} \frac{g\pi}{2}$$

$$= e^{-\frac{B\pi}{2}} + \frac{A\pi}{2}i$$

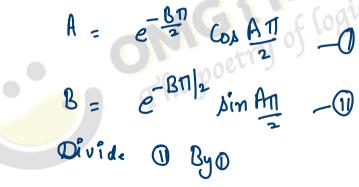
$$= e^{\frac{B\pi}{2}} \cdot e^{\frac{A\pi}{2}}i$$

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A + iB = 
$$e^{-\frac{BT}{2}}$$
 Cox ATT +  $ie^{-\frac{BT}{2}}$  sin ATT

Compare real and imaginary parts



e-BN/2 sin A 11/2

$$= e^{-\beta T} \left( \cos^2 \frac{AT}{T} + \sin^2 \frac{AT}{T} \right)$$

$$A^2 + B^2 = e^{-\beta T}$$

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