

$$f(z) = e^{iz} = e^{i(x+iy)} = e^{ix-y} = e^{-y}(\cos x + i \sin x) \\ = e^{-y} \cos x + i e^{-y} \sin x$$

$$\operatorname{Re} z = e^{-y} \cos x \quad \operatorname{Im} z = e^{-y} \sin x$$

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