

$$9. f(z) = \exp(z^2) \quad D.V$$

$$9a \quad f(z) = z \cdot \exp(z) \quad D.V$$

$$9b \quad f(z) = \sin(z)$$

$$\exp(iz) = \cos(z) + i \sin(z)$$

$$\exp(-iz) = \cos(z) - i \sin(z)$$

$$\exp(iz) - \exp(-iz) = 2i \sin(z)$$

$$\sin(z) = \frac{\exp(iz) - \exp(-iz)}{2i}$$

$$z = x + iy$$

$$\exp(-iz) = \exp(-ix + y) =$$

$$= \exp(y) \cdot \exp(-ix) =$$

$$= \exp(y) (\cos(x) - i \sin(x))$$

$$\exp(x + iy) = e^x (\cos(y) + i \sin(y))$$

Euler's formula

$$\exp(iy) = \cos(y) + i \sin(y)$$