

1. Using the Cauchy-Riemann equations investigate which of the following functions are differentiable and at which points of their domain of definition.

$$f(z) = \bar{z}, f(z) = z - \bar{z}, f(z) = 2x + ixy^2, f(z) = e^x e^{-iy},$$
$$f(z) = e^{-x} e^{-iy}, f(z) = (x + iy)^3, f(z) = \frac{1}{x+iy}, f(z) = x^2 + y^2, (x + iy)y.$$