

Name: _____

Section: 100

Please complete the following exercises. You may collaborate with your classmates, consult your notes or text, and/or ask for help. Note that participation in this activity is not optional.

1. Confirm that each function satisfies the Cauchy-Riemann equations.

(a) $h(z) = z + 2i$

(b) $f(z) = z^2 + z$

(c) $g(z) = \frac{1}{z}$ (except, of course, at $z = 0$)

2. Consider following function (defined in terms of $z = x + iy$, where x and y are the real and imaginary parts of z , respectively).

$$f(x + iy) = (x^3 + 3x^2y - y^3 - x^2 - 2y^2) + (-x^3 + 3xy^2 - y^3 + 4xy + 3y)i$$

- (a) Where does f satisfy CR? Describe the set of points clearly.

- (b) Is the function differentiable at those points?

- (c) If yes, what is the derivative?