

Using the approach of A4 pg 39 Ex 2.4

$$f(x+iy) = (3x^2 - 3y^2 - y) + i(6xy + x)$$

then  $u = 3x^2 - 3y^2 - y$  and  $v = 6xy + x$

$$\frac{\partial u}{\partial x} = 6x$$

$$\frac{\partial u}{\partial y} = -6y - 1$$

$$\frac{\partial v}{\partial x} = 6y + 1$$

$$\frac{\partial v}{\partial y} = 6x$$

So  $\frac{\partial u}{\partial x} = \frac{\partial v}{\partial y}$  and  $\frac{\partial v}{\partial x} = -\frac{\partial u}{\partial y}$  for  $x+iy \in \mathbb{C}$

and the C-R equations are satisfied on whole of  $\mathbb{C}$

Also the partial derivatives are all continuous on whole of  $\mathbb{C}$ .

So by C-R Converse Th<sup>m</sup> (Th<sup>m</sup> 42)  $f$  is entire.