

Panel 1

Complex HW

① Show that the following functions are entire:

a) $f(z) = 3x + y + i(3y - x)$

b) $f(z) = e^{-y} \sin(x) - i e^{-y} \cos(x)$

② Show that the following functions are nowhere analytic

a) $f(z) = xy + iy$

b) $f(z) = 2xy + i(x^2 - y^2)$

③ Show that $u(x, y)$ is harmonic

a) $u(x, y) = 2x - x^3 + 3xy^2$

b) $u(x, y) = \frac{y}{x^2 + y^2}$

Panel 2

① Show that $u(x,y)$ is harmonic

a) $u(x,y) = 2x - x^3 + 3xy^2$

b) $u(x,y) = \frac{y}{x^2+y^2}$