

Panel 1

Complex Home work #1

① Find the real and imaginary (principle) parts of:

a)  $\pi^i$

b)  $i^\pi$

② Find the magnitude (abs. value) as a decimal # for:

a)  $\cos(3i)$

b)  $\sin(3i)$

What is interesting about your answers?

③ Suppose  $z(t) = (5+i)t + 7t$  and  $w(t) = 3ie^{2it}$ . Find

a)  $z'(t)$

b)  $w'(t)$

c)  $\int_0^1 z(t) dt$

d)  $\int_0^\pi w(t) dt$

Panel 2

④ Find an example of a function  $z(t) = x(t) + iy(t)$  for which

a) the Mean Value Theorem for differentiation does not hold

b) the Mean Value Theorem for integration does not hold

Hint: try  $z(t) = e^{it}$  with  $t \in [-\pi, \pi]$