

Panel 10

Homework:

① Find the following values:

a)  $e^i$    b)  $\cos(i)$    c)  $\sin(\pi + i)$    d)  $z^i$    e)  $i^i$  (bonus)

f)  $\sin(2i)$    g)  $\tan\left(\frac{\pi + i}{2}\right)$

② Use power series to show - without L'Hospital - that

a)  $\lim_{z \rightarrow 0} \frac{e^z - 1}{z} = 1$    b)  $\lim_{z \rightarrow 0} \frac{\cos(z) - 1}{z} = 0$    c)  $\lim_{z \rightarrow 0} \frac{\sin(z)}{z} = 1$

③ Show that  $f(z) = ze^z$  satisfies the CR equations

④ Solve   a)  $e^z = -4$    b)  $e^z = z + 2i$

⑤ Show that  $|e^{-z}| < 1$  iff  $\operatorname{Re}(z) > 0$