Tutorial 2.

1. (a) Write $|\exp(3z+i)|$ in terms of x and y.
   (b) Write $|\exp(iz^2)|$ in terms of x and y.
   (c) Show that $|\exp(2z+i)+\exp(iz^2)| \leq e^{2x}+e^{-2xy}$.
2. (a) Show that $\operatorname{Log}(\sqrt{5}+2) = -\operatorname{Log}(\sqrt{5}-2)$.
   (b) Find all the roots of $\cos z = 2$.
3. Show that if $\operatorname{Re} z_1 > 0$ and $\operatorname{Re} z_2 > 0$ then $\operatorname{Log}(z_1 z_2) = \operatorname{Log} z_1 + \operatorname{Log} z_2$.
4. Show that
   (a) if $\log z = \operatorname{Log} r + i\theta$ $(r > 0, \pi/4 < \theta < 9\pi/4)$, then $\log(i^2) = 2\log i$.
   (b) if $\log z = \operatorname{Log} r + i\theta$ $(r > 0, 3\pi/4 < \theta < 11\pi/4)$, then $\log i^2 \neq 2\log i$.
5. Find the principal value of
   (a) i^{3i};
   (b) $[\frac{e}{2}(-1+i\sqrt{3})]^{3\pi i}$.