Math 427
Autumn 2019
Homework 3

Section 2.2: 8
Section 2.3: 5, 10

Additional problems:

1. Express the following functions of $z$ in the form $u(x, y)+i v(x, y)$.
(a.) $\sin z$ (hint: first express $\sin z$ in terms of $e^{ \pm i z}$.)
(b.) $z^{2}+\bar{z}^{2}$
(c.) $z e^{-z}$
(d.) $|z|^{2}$
2. For each function in problem 1 check whether the Cauchy-Riemann equations are satisfied.
3. For $\log z$ any branch of the logarithm, use the chain rule and the relation $e^{\log z}=z$ to give another derivation of $(\log z)^{\prime}$ off its cut-line (you may assume the branch of $\log z$ is analytic off the cut-line).
