

Homework I

➤ **Section 13.1**

Let $z_1 = 2+3i$ and $z_2 = 4-5i$. Showing the details of your work, find (in the form $x + yi$)

12) $\frac{\overline{z_1}}{z_2}, \overline{(z_1 / z_2)}$

15) $\frac{z_1 + z_2}{z_1 - z_2}$

➤ **Section 13.2**

Represent in polar form and graph in the complex plane

8) $\frac{2+3i}{5+4i}$

Represent in the form $x+yi$ and graph it in the complex plane

18) $4 (\cos \pi/3 \pm i \sin \pi/3)$

Find and graph all roots in the complex plane

21) $\sqrt{-i}$

Solve and graph all solutions, showing the details

27) $z^2 - (8-5i)z + (40-20i) = 0$

➤ **Section 13.3**

Find and sketch the sets in the complex plane given by

4) $-\pi < \operatorname{Re}(z) < \pi$

Find $\operatorname{Re}(f)$ and $\operatorname{Im}(f)$. Also find its value at the given point z .

13) $f(z) = z/(z+1)$; evaluate at $z=4-5i$

Find out (and give reason) whether $f(z)$ is continuous at $z=0$ if $f(0) = 0$ and for $z \neq 0$ the function f is equal to

19) $(\operatorname{Im} z) / (1-|z|)$

Differentiate

24) $z^2 / (z+i)^2$

➤ **Section 13.4**

Are the following functions analytic ?

1) $f(z) = z^4$

9) $f(z) = \frac{i}{z^8}$