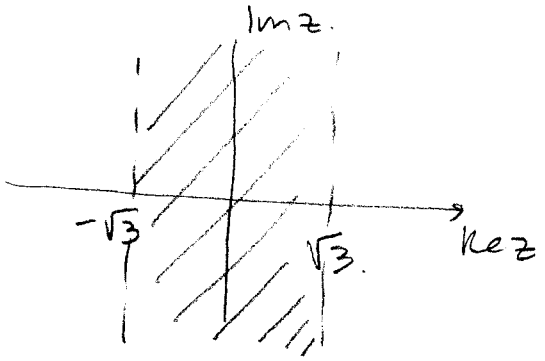
HW2 (6) — A sol'n

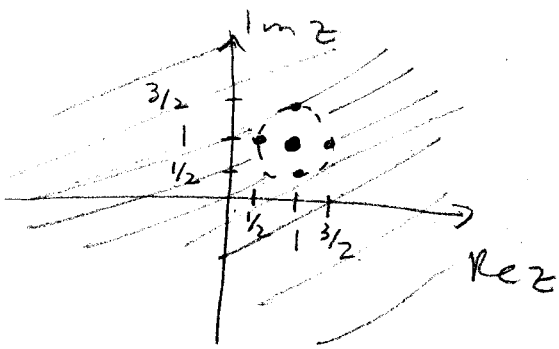
AEM I
F2007
Gross

(6a) $(\mathrm{Re}\, z)^2 < 3$.

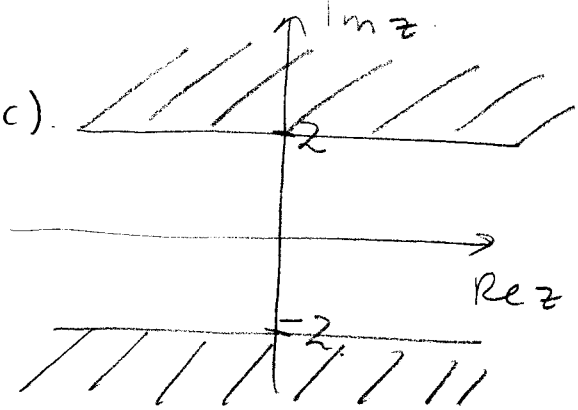
$\Leftrightarrow \quad -\sqrt{3} < \mathrm{Re}\, z < \sqrt{3}$.



(6b) $|z - (1+i)| > 1/2$



(6c)

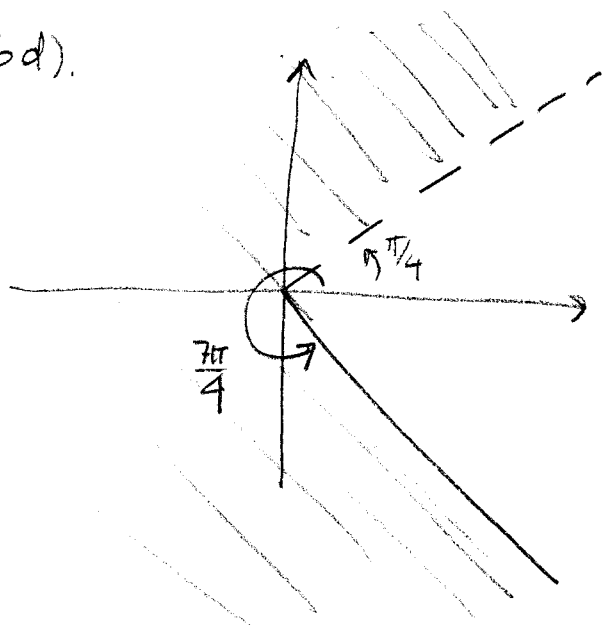


$|\mathrm{Im}\, z| \geq 4 \iff$

$\mathrm{Im}\, z \geq 2$ or

$\mathrm{Im}\, z \leq -2$.

(6d).

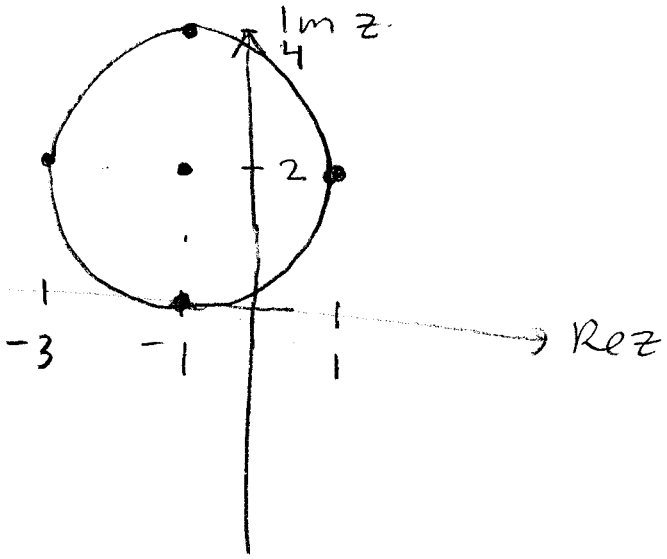


$\frac{\pi}{4} < \arg z \leq \frac{7\pi}{4}$

(6e) $|-3(z-(-1+2i))| = 6 \iff$

$\iff |-3||z-(-1+2i)| = 6$ because $|z_1 z_2| = |z_1||z_2|$

$\iff |z-(-1+2i)| = 2$



(6f) $|z-1|+|z+1| = 7$ is an ellipses because the set of points, the sum of whose distances to two specified points (here ± 1) is a fixed distance (here 7), is an ellipse by definition.

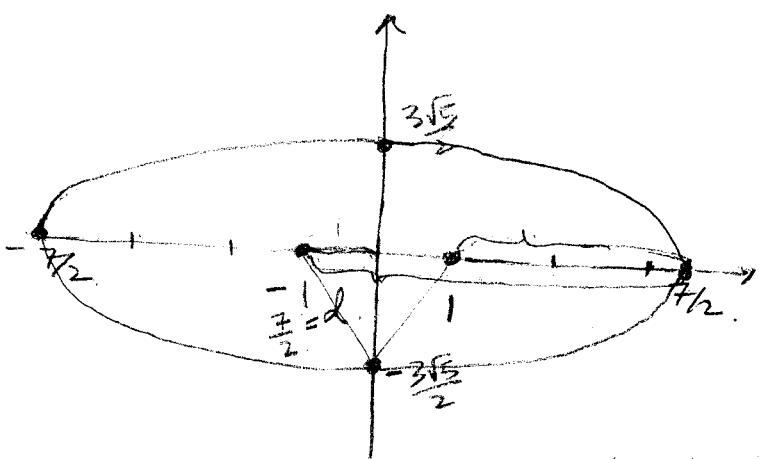
$b^2 + 1^2 = \frac{49}{4}$

$b = \pm\sqrt{\frac{49-4}{4}}$

$= \pm\frac{3\sqrt{5}}{2}$

$a+1+a-1 = 7$

$2a = 7 \to a = 7/2$.



$1^2 + \frac{45}{4} = \frac{49}{4}$ ✓