Problem 1.3

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0.0/4.0 points (ungraded)

(i) Determine the image of a line $\mathrm{Im}\ z = 1$ under the map $z \to w(z) = z^3 + 3z - i$.

This image can be characterized by the following function:

$$\square = \square + 3\left|\square\right|^{\square}$$

1	2	-1	-2	$\mathrm{Im}\ \omega$	$\mathrm{Re}\ \omega$

(ii) Determine the image of a circle $|z - i| = 1$ under the map $z \to w(z) = \frac{1}{z-2i}$.

Show that this image is a straight line on the complex plane. Derive the equation describing this straight line.

$$\mathrm{Im}\ \omega = \square + \square\ \mathrm{Re}\ \omega$$

0	1	-1	$1/2$	$-1/2$	

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Solutions
It would be helpful if their could be a full solution available for the problems please. 4