**Q03** To start we know that $z$ (and thus $|z|$) can be expressed as:

$$z = a + bi \text{ (for a,b} \in \mathbb{R})$$

$$|z| = \sqrt{a^2 + b^2}$$

We thus can plus this equation into the bounds of $|z|$:

$$1 < \sqrt{a^2 + b^2} < 4$$
$$1 < a^2 + b^2 < 16$$

Let the outer bounds (values a and b must be less then) be in the form (a,b), they can be represented as:

$$[0, 4), [0, -4), (4, 0], (-4, 0]$$

Let the inner bounds (balues a and b must be greater then) be in the form (a,b), they can be represented as:

$$[0, 1), [0, -1), (1, 0], (-1, 0]$$

Thus we can see the graph for $|z|$ would be the graph of a circle with radius 4 with a hole in the shape of a circle with radius 1.
Adding $i$ would be an upward shift of 1 in the imaginery direction, thus resulting in the following graph where the shaded region of the complex plane represents $\{i + \overline{z} \colon 1 < |z| < 4, z \in \mathbb{C}\}$: