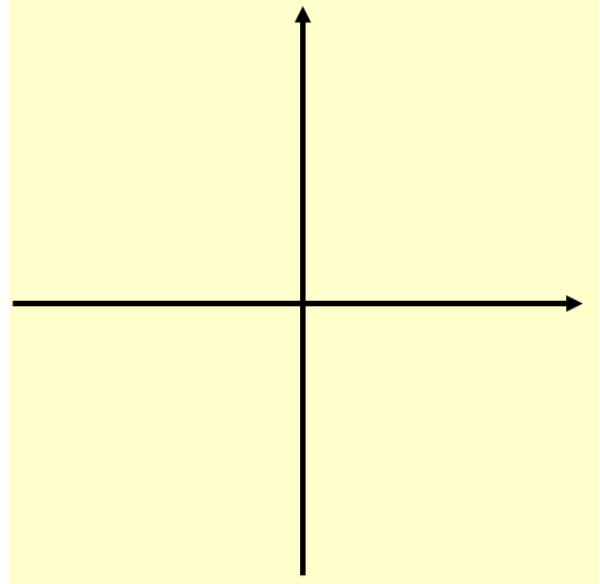


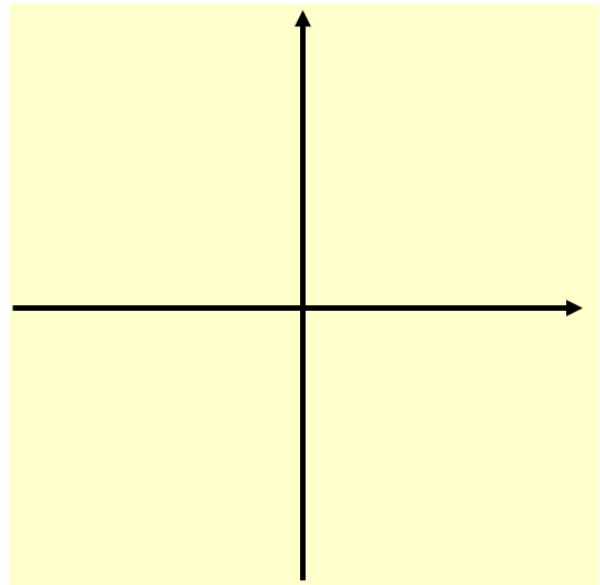
2E Loci on Argand Diagrams

$$|z - z_1| = r$$



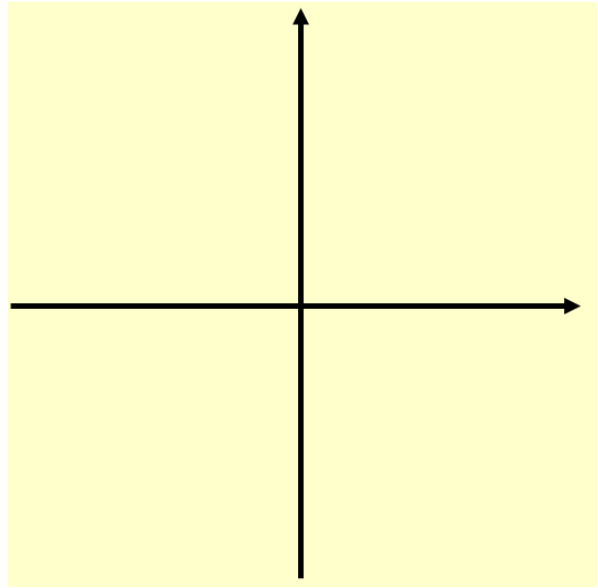
1. Given that $|z - 4| = 5$

a) Sketch the locus of z on an Argand diagram

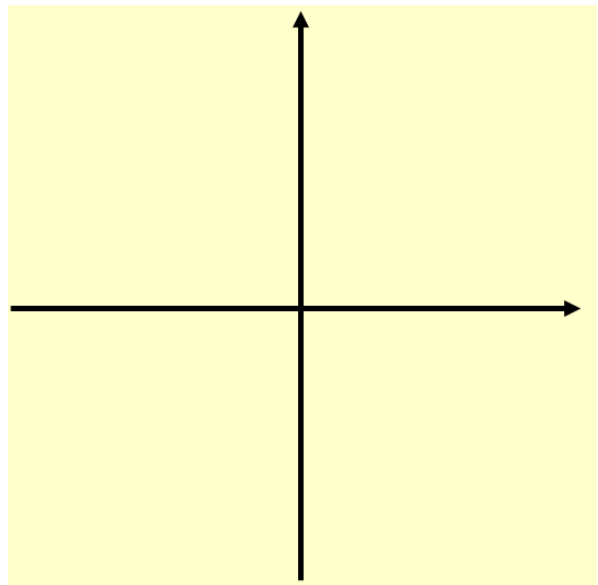


b) Find the values of z that satisfy:

i) $|z - 4| = 5$ and $Im(z) = 0$

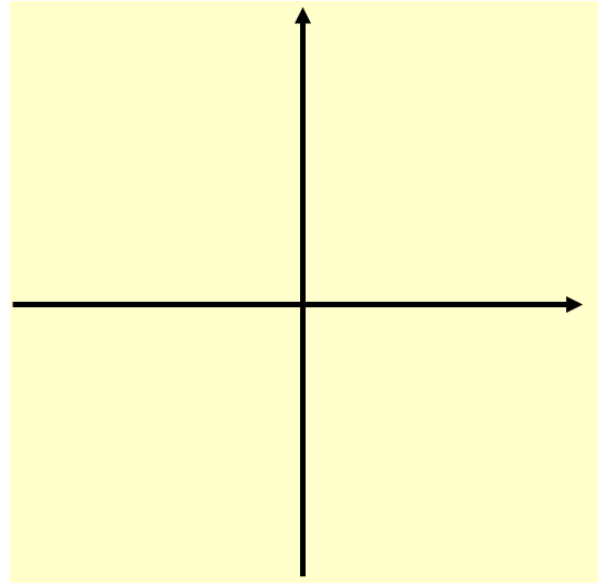


ii) $|z - 4| = 5$ and $Re(z) = 0$

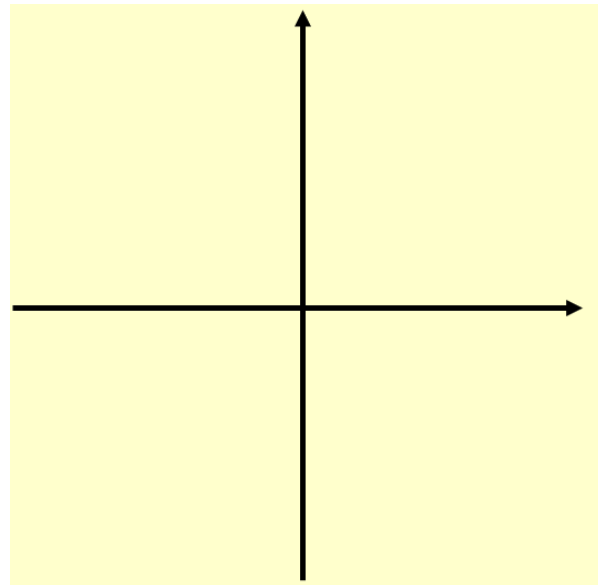


2. If $|z - 5 - 3i| = 3$

a) Sketch the locus of $P(x,y)$ which is represented by z on an Argand diagram



b) Find the maximum value of $\arg z$ in the interval $(-\pi, \pi)$

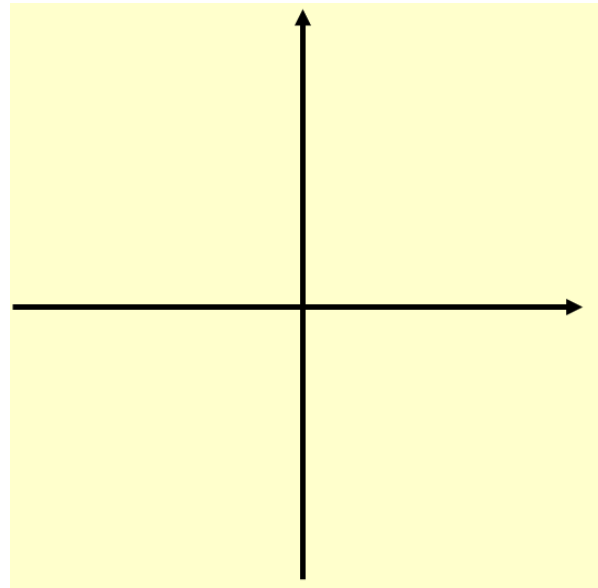


c) Use an algebraic method to find a Cartesian equation of the locus of z

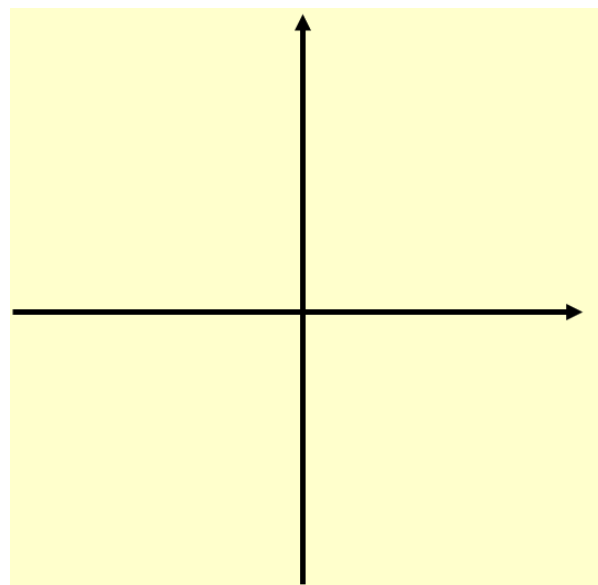
3. Given that the complex number $z = x + iy$ satisfies the equation:

$$|z - 12 - 5i| = 3$$

Find the minimum and maximum values of $|z|$



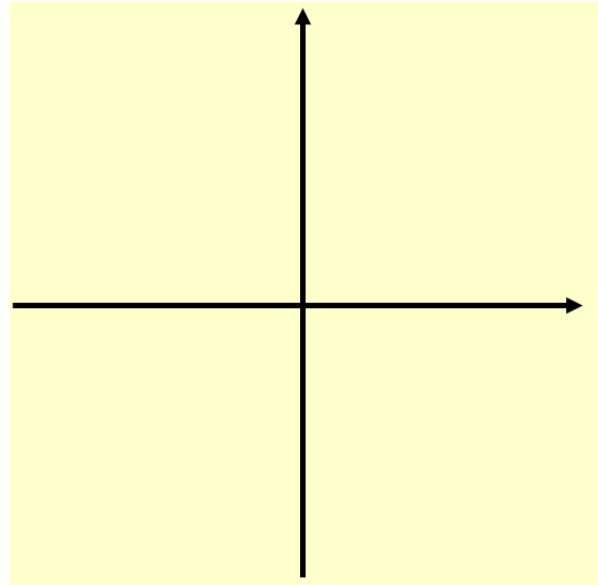
Notes on Loci for $|z-z_1|=|z-z_2|$



4. Sketch the locus of $P(x,y)$ which is represented by z on an Argand diagram, if:

a)

$$|z| = |z - 6i|$$



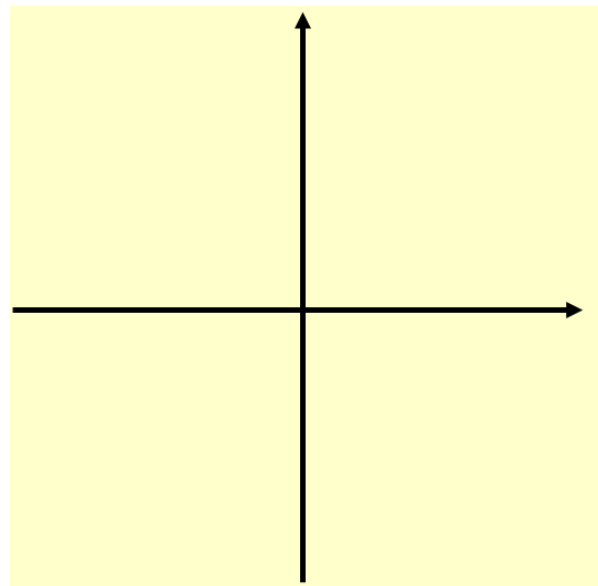
b) Show that the locus is $y = 3$ using an algebraic method

5.

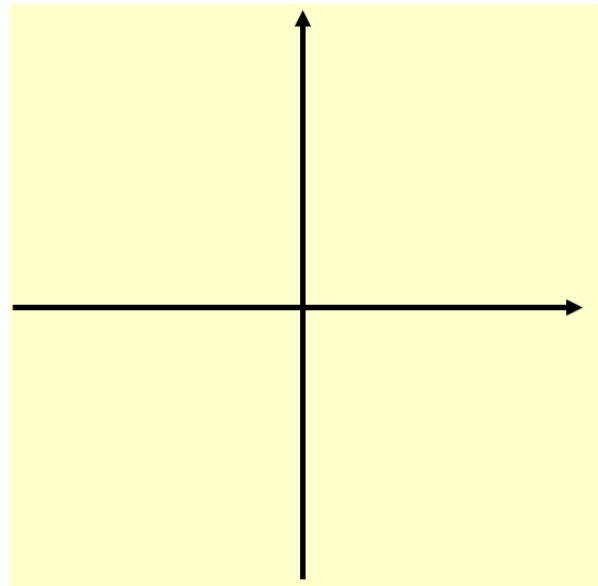
a) Use an algebraic method to find the Cartesian equation of the locus of z if:

$$|z - 3| = |z + i|$$

c) Represent the locus of z on a cartesian set of axes



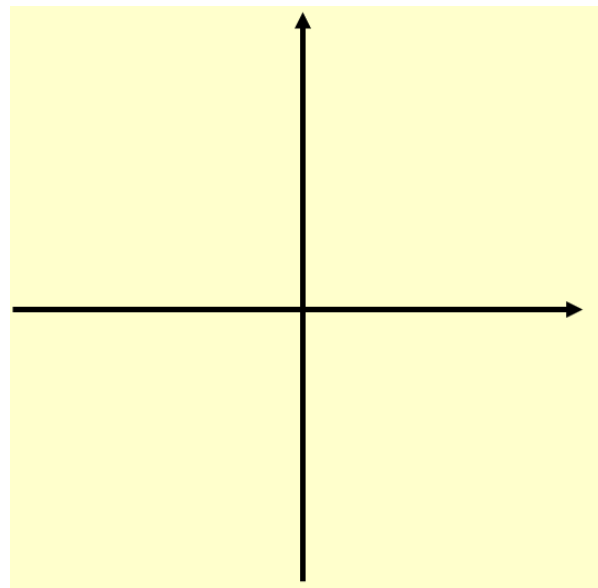
Notes on Loci for $\arg z = \theta$



6. If

$$\arg z = \frac{\pi}{4}$$

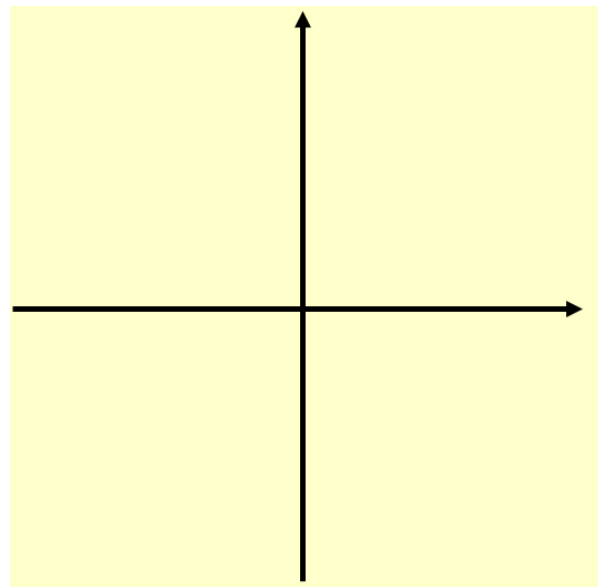
Sketch the locus of $P(x,y)$ which is represented by z on an Argand diagram. Then find the Cartesian equation of this locus algebraically.



7. If

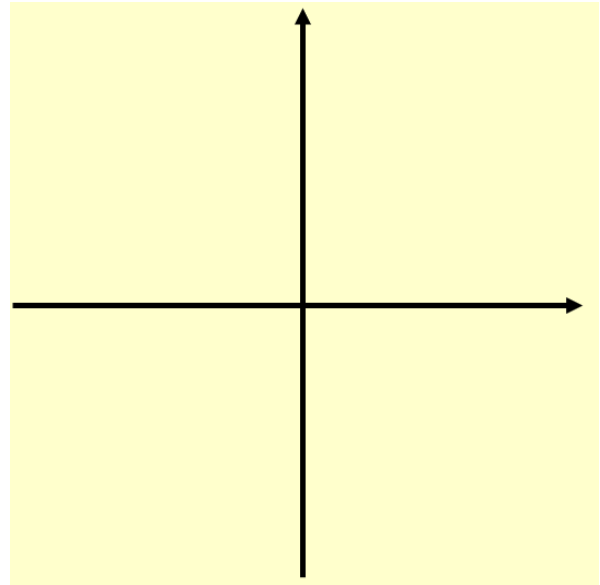
$$\arg(z - 2) = \frac{\pi}{3}$$

Sketch the locus of $P(x,y)$ which is represented by z on an Argand diagram. Then find the Cartesian equation of this locus algebraically.



8. If

$$\arg(z + 3 + 2i) = \frac{3\pi}{4}$$



Sketch the locus of z on an Argand diagram and use an algebraic method to find the equation of the line.