**2A Introduction to Argand Diagrams**



1. Represent the following complex numbers on an Argand diagram:

$$z\_{1}=2+5i$$

$$z\_{2}=3-4i$$

$$z\_{3}=-4+i$$



Find the magnitude of |OA|, |OB| and |OC|, where O is the origin of the Argand diagram, and A, B and C are z1, z2 and z3 respectively

1. $z\_{1}=4+i$ $z\_{2}=3+3i$

Show z1, z2 and z1 + z2 on an Argand diagram



1. $z\_{1}=2+5i$$z\_{2}=4+2i$

Show z1, z2 and z1 - z2 on an Argand diagram



**2B Modulus & Argument**



1. Find, to two decimal places, the modulus and argument of z = 4 + 5i



1. Find, to two decimal places, the modulus and argument of z = -2 + 4i



1. Find, to two decimal places, the modulus and argument of z = -3 - 3i



**2C Modulus-Argument Form**



1. Express the numbers following numbers in the modulus argument form:
2. $z\_{1}=1+i\sqrt{3}$
3. $z\_{2}=-3-3i$

**2D Multiplying & Dividing in Modulus-Argument Form**

1. Express the following calculation in the form x + iy:

$$3\left(cos\frac{5π}{12}+isin\frac{5π}{12}\right)×4\left(cos\frac{π}{12}+isin\frac{π}{12}\right)$$

$$2\left(cos\frac{π}{15}+isin\frac{π}{15}\right)×3\left(cos\frac{2π}{5}-isin\frac{2π}{5}\right)$$

$$\frac{\sqrt{2}\left(cos\frac{π}{12}+isin\frac{π}{12}\right)}{2\left(cos\frac{5π}{6}+isin\frac{5π}{6}\right)}$$

 **2E Loci on Argand Diagrams**

$$\left|z-z\_{1}\right|=r$$



1. Given that $\left|z-4\right|=5$
2. Sketch the locus of z on an Argand diagram



1. Find the values of z that satisfy:
2. $\left|z-4\right|=5$ and $Im\left(z\right)=0$



1. $\left|z-4\right|=5$ and $Re\left(z\right)=0$



1. If $\left|z-5-3i\right|=3$
2. Sketch the locus of P(x,y) which is represented by z on an Argand diagram



1. Find the maximum value of argz in the interval (-π,π)



1. Use an algebraic method to find a Cartesian equation of the locus of z
2. Given that the complex number z = x + iy satisfies the equation:

$$\left|z-12-5i\right|=3$$

Find the minimum and maximum values of |z|



Notes on Loci for |z-z1|=|z-z2|



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

$$\left|z\right|=\left|z-6i\right|$$



1. Show that the locus is y = 3 using an algebraic method
2. Use an algebraic method to find the Cartesian equation of the locus of z if:

$$\left|z-3\right|=\left|z+i\right|$$

1. Represent the locus of z on a cartesian set of axes



Notes on Loci for argz = ɵ



1. If

$$argz=\frac{π}{4}$$

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.



1. If

$$arg⁡(z-2)=\frac{π}{3}$$

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.



1. If

$$arg⁡(z+3+2i)=\frac{3π}{4}$$



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

**2F Shading Regions on Argand Diagrams**

1. Shade on an Argand diagram the region indicated by:

$$\left|z-4-2i\right|\leq 2$$



$$\left|z-4\right|<\left|z-6\right|$$



$$0\leq arg\left(z-2-2i\right)\leq \frac{π}{4}$$

