TD NO. 2 (Complex numbers)

$(L.E)$ = **Leave to the students.**

Exercise 1:

1) Put the following complex numbers in algebraic form:

$$\frac{3+6i}{3-4i} \quad ; \quad \left(\frac{1+i}{2-i}\right)^2+\frac{3+6i}{3-4i} \quad (L.E) \quad ; \quad \frac{2+5i}{1-i}+\frac{2-5i}{1+i}$$

$$\left(-\frac{1}{2}+i\frac{\sqrt{3}}{2}\right)^3 \quad (L.E) \quad ; \quad \frac{(1+i)^9}{(1-i)^7} .$$

Exercise 2:

1) Put the following complex numbers in trigonometric form:

$$1+i \quad ; \quad 1-i\sqrt{3} \quad ; \quad -\sqrt{3}+i \quad (L.E) \quad ; \quad \frac{1+i\sqrt{3}}{-\sqrt{3}+i} \quad (L.E) .$$

2) Calculate the real part and the imaginary part of the complex number : $z=\left(\frac{1+i\sqrt{3}}{1+i}\right)^{125}$.

Exercise 3:

Let the equation: $(z^2+4z+1)^2+(3z+5)^2=0$ …… **(*)**

1) Show that (*) is equivalent to two equations of degree 2.

2) Solve the two equations, deduce the solutions of (*).

Exercise 4: $(L.E)$

Let the equation: $z^3-(16-i)z^2+(89-16i)z+89i=0$ …… **(**)**

1) Show that (**) is equivalent to two equations of degree 1 and 2.

2) Solve the two equations, deduce the solutions to (**).

3) Draw the triangle formed by the three points whose affixes are the solutions of (**). Then show that it is isosceles.

Module manager

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