PENANG SANGAM HIGH SCHOOL
YEAR 13 MATHEMATICS
WEEK 1
Dates: (31/05/21) to (04/06/21)

WORKSHEET 1 **COMPLEX NUMBERS**

1. Evaluate a. i^7 b. $\sqrt{-100}$

2. Given a complex number z = $\sqrt{2} - 2i$

a Find the Re(z)_____ and Im(z) _____

b. Find the $|z|$ =_____

c. Find the arg(z)= _____

d. Find $\bar{z}$ =_____

e. Plot z and $\bar{z}$ on an argand diagram.

3. Two complex numbers are given as $a = 3 - i$ and $b = 2 + 3i$.
Show that |ab| = |a||b|

4. Express $\frac{3+4i}{i}$ in the form $a + bi$.

5. Given z = 2 (cos $\frac{\pi}{6}$ + i sin $\frac{\pi}{6}$) and w = 3 (cos $\frac{\pi}{3}$ i sin $\frac{\pi}{3}$)

a. Find $|z|$

b. Find arg (w)

c. Find $z.w$ and give the answer in rectangular form

6. Sketch the following
a. |z| ≤ 2 b. Sketch $-1 < \text{Im}(z) \leq 2$

7. Given a complex number z = -27i

a. Write z in polar form

b. Find z^5 by using the De Moivres Thoerem

c. Find cube roots of the complex number [Solve z^3]

8. Given $P = 6(\cos 60° + i \sin 60°)$ and $Q = 2(\cos -30° + i \sin -30°)$
a. Represent **P** on an Argand Diagram.

b. Find PQ and express your answer in **rectangular** form.

9. Find the values of *x* and y such that $(x - y) - 3i = 6 + yi$.

10. Solve : $x^2 + 2x + 5 = 0$

11. Find all cube roots of $z = 27\ cis\ 30°$ and give your answer in rectangular form.

12. Evaluate $i^2 (3i + 2i^3)$

13. Find cube roots of $2 + 2\sqrt{3}\ i$. Express your answer in rectangular form.