



ST. LAWRENCE HIGH SCHOOL
A JESUIT CHRISTIAN MINORITY INSTITUTION



WORKSHEET-9
SUBJECT – MATHEMATICS
1st - Term

Chapter: ALGEBRA

Class: XI

Topic: Complex numbers

Date: 18.07.2020

Choose the correct option (1 x 15=15)

1. If $(x + iy)^{1/3} = a + ib$, then $\frac{x}{a} + \frac{y}{b} =$
(a) 0 (b) 1 (c) -1 (d) none of these
2. $(\sqrt{-2})(\sqrt{-3})$ is equal to
(a) $\sqrt{6}$ (b) $-\sqrt{6}$ (c) $i\sqrt{6}$ (d) none of these
3. The value of $(1 + i)^4 + (1 - i)^4$ is
(a) 8 (b) 4 (c) -8 (d) -4
4. If $\sqrt{a + ib} = x + iy$, then possible value of $\sqrt{a - ib}$ is
(a) $x^2 + y^2$ (b) $\sqrt{x^2 + y^2}$ (c) $x + iy$ (d) $x - iy$
5. If $z = \cos \frac{\pi}{4} + i \sin \frac{\pi}{6}$, then
(a) $|z| = 1, \arg(z) = \frac{\pi}{4}$ (b) $|z| = 1, \arg(z) = \frac{\pi}{6}$
(c) $|z| = \frac{\sqrt{3}}{2}, \arg(z) = \frac{5\pi}{24}$ (d) $|z| = \frac{\sqrt{3}}{2}, \arg(z) = \tan^{-1} \frac{1}{\sqrt{2}}$
6. The polar form of $(i^{25})^3$ is
(a) $\cos \frac{\pi}{2} + i \sin \frac{\pi}{2}$ (b) $\cos \pi + i \sin \pi$ (c) $\cos \pi - i \sin \pi$ (d) $\cos \frac{\pi}{2} - i \sin \frac{\pi}{2}$

7. If $i^2 = -1$, then the sum $i + i^2 + i^3 + \dots$ upto 1000 terms is equal to
 (a) 1 (b) -1 (c) i (d) 0
8. If $z = \frac{-2}{1+i\sqrt{3}}$, then the value of $\arg(z)$ is
 (a) π (b) $\frac{\pi}{3}$ (c) $\frac{2\pi}{3}$ (d) $\frac{\pi}{4}$
9. If $a = \cos \theta + i \sin \theta$, then $\frac{1+a}{1-a} =$
 (a) $\cot \frac{\theta}{2}$ (b) $\cot \theta$ (c) $i \cot \frac{\theta}{2}$ (d) $i \tan \frac{\theta}{2}$
10. If $(1+i)(1+2i)(1+3i) \dots (1+ni) = a+ib$, then $2 \cdot 5 \cdot 10 \cdot 17 \dots (1+n^2) =$
 (a) $a-ib$ (b) a^2-b^2 (c) a^2+b^2 (d) none of these
11. If $\frac{(a^2+1)^2}{2a-i} = x+iy$, then x^2+y^2 is equal to
 (a) $\frac{(a^2+1)^4}{4a^2+1}$ (b) $\frac{(a+1)^2}{4a^2+1}$ (c) $\frac{(a^2-1)^2}{(4a^2-1)^2}$ (d) none of these
12. The principal value of the amplitude of $(1+i)$ is
 (a) $\frac{\pi}{4}$ (b) $\frac{\pi}{12}$ (c) $\frac{3\pi}{4}$ (d) π
13. The least positive integer n such that $\left(\frac{2i}{1+i}\right)^n$ is a positive integer, is
 (a) 16 (b) 8 (c) 4 (d) 2
14. If z is a non-zero complex number, then $\left|\frac{|\bar{z}|^2}{z\bar{z}}\right|$ is equal to
 (a) $\left|\frac{\bar{z}}{z}\right|$ (b) $|z|$ (c) $|\bar{z}|$ (d) none of these
15. If $a = 1+i$, then a^2 equals
 (a) $1-i$ (b) $2i$ (c) $(1+i)(1-i)$ (d) $i-1$

1.d, 2.b, 3.c, 4.d,
 5.d, 6.d, 7.d, 8.c,
 9.c, 10.c, 11.a,
 12.a, 13.b, 14.a,
 15.b

Prepared By –

Mr. Sukumar Mandal (SkM)