(x, y) is in 3rd quadrant, $\quad$ then $-\pi < P.V. of\ \theta < -\frac{\pi}{2}$

(x, y) is in 4th quadrant, $\quad$ then $-\frac{\pi}{2} < P.V. of\ \theta < 0$

(4) **Modulus-Amplitude Form**

$z = r(\cos\theta + i\sin\theta)$

where,

$r = |z|$

$\theta = Arg. z$

(5) $|z_1 + z_2| \leq |z_1| + |z_2|$

(6) $|z_1 z_2| = |z_1||z_2|$

(7) $\left|\frac{z_1}{z_2}\right| = \frac{|z_1|}{|z_2|}$

(8) (i) $Arg\ (z_1 z_2) = Arg\ z_1 + Arg\ z_2 + m$

(ii) $Arg\ \left(\frac{z_1}{z_2}\right) = Arg\ z_1 - Arg\ z_2 + m$

where, $m = 0$ or $\pm 2\pi$

(9) The three cube roots of 1 are $1, w, w^2$

where, $w = \frac{-1 \pm \sqrt{3}i}{2}$

(10) If w is a complex cube root of 1, then $w^3 = 1$ & $1 + w + w^2 = 0$.

(11) **De-Moivre's Theorem**

$(\cos\theta + i\sin\theta)^n = \cos n\theta + i\sin n\theta$

(12) **Euler's Identity**

$e^{\pm i\theta} = \cos\theta \pm i\sin\theta$

AP

(1) If the 1st term $= a$ & the common difference $= d$ in an A.P., then

(a) $n-th$ term, $t_n = a + (n-1)d$

(b) Sum of 1st n terms,

$S_n = \frac{n}{2}(a + l)$

$= \frac{n}{2}\{2a + (n-1)d\}$

(2) $1 + 2 + 3 + \cdots \ldots \ldots .. + n = \frac{n(n+1)}{2}$

(3) $1^2 + 2^2 + 3^2 + \cdots \ldots \ldots .. + n^2 = \frac{n(n+1)(2n+1)}{6}$

(4) $1^3 + 2^3 + 3^3 + \cdots \ldots \ldots .. + n^3 = \left\{\frac{n(n+1)}{2}\right\}^2$

(5) If x be the AM of two numbers a & b, then $x = \frac{(a+b)}{2}$

GP