(D) circle

12. The solution of the equation $e^{2z} + e^{z+1} + e^z + e = 0$ is

    (A) πi

    (B) $\pi i + 1$

    (C) $1 + 3\pi i$

    (D) all of the above

13. If z is a complex number, then $f(z) = sin(z)$ is

    (A) bounded

    (B) unbounded

    (C) bounded at $z = 1 + i$

    (D) none of these

14. If z_1 and z_2 are complex number, then $z_1\overline{z_2} + \overline{z_1}z_2 = 0$ implies

    (A) z_1 and z_2 are perpendicular

    (B) z_1 and z_2 are parallel

    (C) z_1 and z_2 are at angle $\frac{\pi}{3}$

    (D) none of these

15. The complex numbers $sinx + icos2x$ and $cosx - isin2x$ are conjugate to each other, for

    (A) $x = n\pi$

    (B) $x = 0$

    (C) $x = (2n + 1)\frac{\pi}{2}$

    (D) none of these

16. If z_1 and z_2 are non-zero complex numbers, such that $|z_1| = |z_2|$ and $Arg(z_1) + Arg(z_2) = 2\pi$ then z_1 equals

    (A) $\overline{z_2}$

    (B) $-\overline{z_2}$

    (C) z_2

    (D) $-z_2$

17. If $|z| = 1$ and $z \neq \pm 1$, then the value of $\dfrac{z}{1 - z^2}$ lies on

    (A) a line not passing through the origin