RESIDUES

Important Question Bank

Designed By

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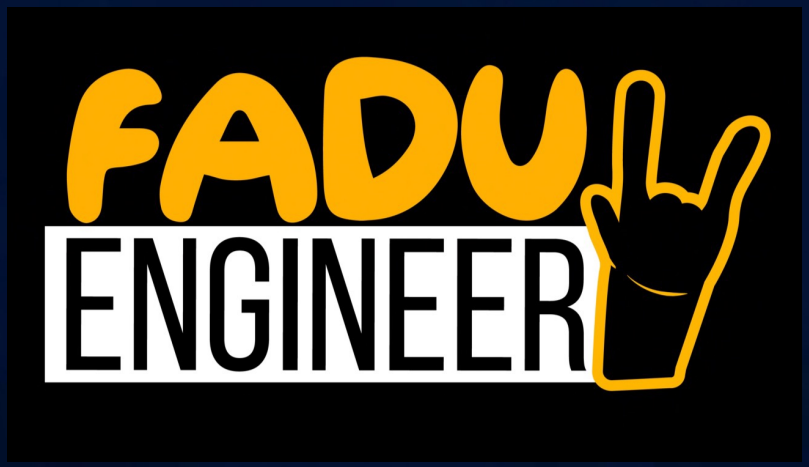

Important Questions

1) Find the residues of $\frac{\sin \pi z^2 + \cos \pi z^2}{(z-1)(z-2)^2}$ at all its poles.

2) Find the residues of at $f(z) = \frac{z}{(z-1)(z+2)^2}$ at its isolated singularities using Laurent's Series Expansion.

3) Determine the poles of $f(z) = \frac{z^2 - z}{(z+1)^2(z^2+4)}$ and find Residue at each pole.

4) Evaluate : $\int_C \frac{z^2}{(z-1)^2(z-2)} dz$, where C is the Circle $|z| = 2.5$.

5) Evaluate : $\int_C \tan z \, dz$, where C (i) is the circle $|z| = 2$, (ii) is circle $|z| = 1$.

6) Evaluate : $\int_C \frac{z+4}{z^2+2z+5} dz$, where C is

(i) $|z+1-i| = 2$ (ii) $|z| = 1$.

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7) Using Residue theorem, Evaluate $\oint_C \frac{e^z}{(z^2+\pi^2)^2} dz$

where C is $|z| = 4$.

8) Using Residue theorem, Evaluate:

$\oint_C \frac{z^2+4}{(z-2)(z+3i)} dz$, where C is (i) $|z+1| = 2$,

(ii) $|z-2| = 2$.

9) Using Cauchy's Residue theorem, Evaluate

$\oint_C \frac{\sin \pi z^2 + \cos \pi z^2}{z^2+3z+2}$, where C is (i) $|z| = 0.5$

(ii) $|z| = 1.5$

10) Using Residue theorem, Evaluate:

$\oint_C \frac{12z-7}{(z-1)^2(2z+3)} dz$, where C is circle (i) $|z| = \frac{1}{2}$,

(ii) $|z| = 2$ (iii) $|z+i| = \sqrt{3}$.

11) Evaluate: $\int_0^{2\pi} \frac{d\theta}{5+3\sin\theta}$.

12) Evaluate: $\int_0^{2\pi} \frac{\cos 2\theta}{5+4\cos\theta} d\theta$

13) Evaluate: $\int_0^{2\pi} \frac{d\theta}{1-2a\sin\theta+a^2}$ .... $0 < a < 1$.

14) Evaluate: $\int_0^{\pi} \frac{d\theta}{3+2\cos\theta}$.

15) By using Cauchy's Residue theorem, Evaluate

$$\int_0^{2\pi} \frac{\cos^2\theta}{5+4\cos\theta}\, d\theta.$$

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