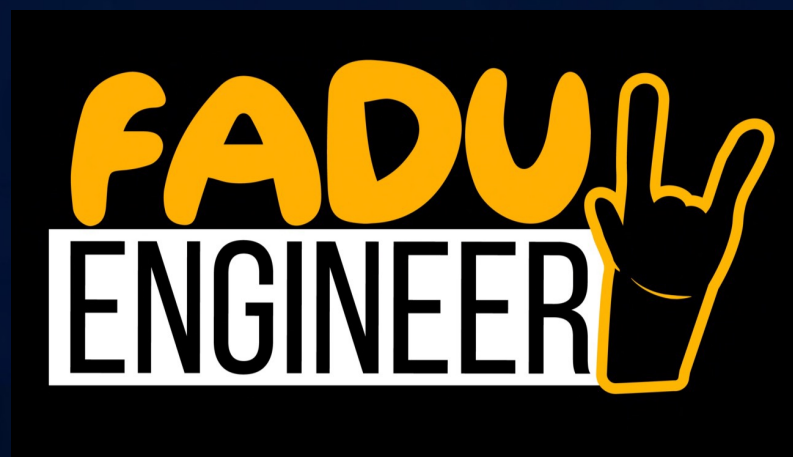


CAUCHY'S THEOREM

Important Question Bank

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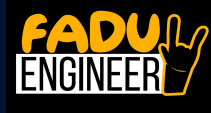


Important Questions

1) Evaluate: $\int_C \frac{\sin^6 z}{(z - \pi/6)^3} dz$, where C is $|z| = 1$.

2) Evaluate: $\oint_C \frac{e^{3z}}{z - \pi i} dz$, where C is the curve
 $|z - 2| + |z + 2| = 6$.

3) Evaluate: $\int_C \frac{z + 3}{2z^2 + 3z - 2} dz$, where C is the circle, $|z - i| = 2$.



4) Evaluate: $\int_C \frac{\sin 3z}{z + (\pi/2)} dz$, where C is the circle
 $|z| = 5$.

5) Evaluate: $\int_C \frac{z^2 + 4}{(z - 2)(z + 3i)} dz$, where C is,

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

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

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

7) If C is the circle $|z| = 1$, using the integral

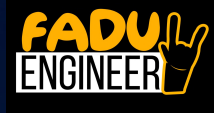
$\int_C \frac{e^{kz}}{z} dz$, where k is real, show that

$$\int_0^\pi e^{k \cos \theta} \cos(k \sin \theta) d\theta = \pi$$

8) If $f(\xi) = \int_c \frac{4z^2 + z + 5}{z - \xi} dz$, where c is the

ellipse $\frac{x^2}{4} + \frac{y^2}{9} = 1$, find the values of

$f(i)$, $f'(-1)$, $f''(-i)$ and $f(3)$.



9) If $\phi(\alpha) = \int_c \frac{ze^z}{z - \alpha} dz$, where c is,

$|z - 2i| = 3$, find the values of (i) $\phi(1)$

(ii) $\phi'(2)$ (iii) $\phi(3)$.

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