Unit 4 - Important theorems in complex variables

Week2 Assessment

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2019-08-21, 23:59 IST.

1) One of the roots of $f(z) = z^4 + 5z^2 + 4$ is *1 point*

- $4i$
- i
- 4
- 1

No, the answer is incorrect.
Score: 0
Accepted Answers:
i

2) The order of the pole at $z = 0$, for the function $f(z) = \frac{1+e^{2z}}{z^2}$ is *1 point*

- 0
- 1
- 2
- 3

No, the answer is incorrect.
Score: 0
Accepted Answers:
3

3) The order of the pole at $z = 1$, for the function $f(z) = \frac{(z^2-1)+\sin(z-1)}{(z-1)}$ is *1 point*

- 2
- 1
- 0
- None of the above

No, the answer is incorrect.
Score: 0
Accepted Answers:
0

4) Let us consider a function $f(x)$, such that $f(-x) = f(x)$, where $f(x)$ is analytic in $x \in (-\infty, \infty)$. The value of $\int_{-\infty}^{\infty} f(x)\,dx$ equals to *1 point*

- $2\int_{0}^{\infty} f(x)\,dx$
- $2\int_{-\infty}^{\infty} f(x)\,dx$
- 0
- None of the above

No, the answer is incorrect.
Score: 0
Accepted Answers:
$2\int_{0}^{\infty} f(x)\,dx$

5) Let us consider a function $f(x)$, such that $f(-x) = -f(x)$, where $f(x)$ is analytic in $x \in (-\infty, \infty)$. The value of $\int_{-\infty}^{\infty} f(x)\,dx$ equals to *1 point*

- $2\int_{0}^{\infty} f(x)\,dx$
- $2\int_{-\infty}^{\infty} f(x)\,dx$
- 0
- None of the above

No, the answer is incorrect.
Score: 0
Accepted Answers:
0

6) The residue of the function $f(z) = \frac{(z^2-1)-\sin(z-1)}{(z-1)}$ at $z = 1$ equals to *0 points*

- 0
- -1
- 2
- 1

No, the answer is incorrect.
Score: 0
Accepted Answers:
1

7) The residue of the function $f(z) = \frac{1}{\sin(z)}$ at $z = 0$ equals to *1 point*

- 1
- -1
- 0
- $1/2$

No, the answer is incorrect.
Score: 0
Accepted Answers:
1

8) The residue of the function $f(z) = \frac{\tanh(z)}{z^2}$ at $z = i\pi/2$ equals to *1 point*

- $4/\pi^2$
- $-4/\pi^2$
- $i\pi^2/4$
- $-i\pi^2/4$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$-4/\pi^2$

9) Let us consider $J = \oint_C f(z)\,dz$, where C is the unit circle with centre at the origin and $f(z) = \frac{1}{2z-1}$. The value of J is equal to *1 point*

- $-2\pi i$
- $2\pi i$
- $-\pi i$
- πi

No, the answer is incorrect.
Score: 0
Accepted Answers:
πi

10) Let us consider $J = \oint_C f(z)\,dz$, where C is the unit circle with centre at the origin and $f(z) = \frac{e^z}{z^2 - \frac{z}{4}}$. The value of J is equal to *1 point*

- $2\pi i \sin(\frac{1}{2})$
- $4\pi i \sin(\frac{1}{2})$
- $4\pi i \sinh(\frac{1}{2})$
- $2\pi i \sinh(\frac{1}{2})$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$4\pi i \sinh(\frac{1}{2})$