Unit 13 - Week 12: Complex Variables, Functions, Differentiation and Integration

Assignment 12

1) The form of the complex number 4-3*i* in polar variables is **1 point**

- $5e^{i\pi/3}$
- $5e^{i2\pi/3}$
- $\sqrt{7}\exp(arctan(-4/3))$
- None of the above

Accepted Answers:
None of the above

2) The principal value of $\log(e^2 + i)$ is **1 point**

- 2
- -2
- $2 + i\pi/2$
- None of the above

Accepted Answers:
None of the above

3) The principal value of the complex number $\log(-3)$ is **1 point**

- $\log(3) + 3i\pi/2$
- ∞
- $\log 3 + i\pi$
- None of the above

Accepted Answers:
$\log 3 + i\pi$

4) Consider the complex function given by **1 point**

$f(z) = \frac{e^z}{z(z^2+z+1)}$

The pole(s) of this function is(are) located at

- 0
- $0, 0.5 + i\sqrt{0.75}, 0.5 - i\sqrt{0.75}$
- $0.5, -0.5$
- $1 + i\sqrt{3}, 1 - i\sqrt{3}, 0$

Accepted Answers:
$0, 0.5 + i\sqrt{0.75}, 0.5 - i\sqrt{0.75}$

5) Consider a complex function given by **1 point**

$f(z) = \frac{1+z^2}{z(z-i)}$

The point $z = i$ is a

- simple pole
- pole of order 2
- regular point
- None of the above

Accepted Answers:
regular point

6) The contour integral **1 point**

$\int_C \frac{e^z}{2z} dz$

where C is a clockwise unit circle centered at z=2 is equal to

- 0
- $i\pi e^2/2$
- $-i\pi e^2/2$
- None of the above

Accepted Answers:
0

7) The contour integral **1 point**

$\int_C \frac{z^2}{(z+i/2)} dz$

where C is a clockwise unit circle centered at z=0 is equal to

- 0
- 1/16
- $i\pi/2$
- None of the above

Accepted Answers:
$i\pi/2$

8) The contour integral of the function **1 point**

$\int_c \frac{z+2}{z^2(z+0.5)} dz$

where C is the counterclockwise unit circle centered at *z*=0 is equal to

- 0
- $12\pi i$
- $-6\pi i$
- None of the above

Accepted Answers:
0

9) The integral **1 point**

$\int_{-\infty}^{\infty} \frac{e^{ix}}{x^2+4} dx$

is equal to

- 0
- $\frac{\pi}{2e^2}$
- $i\pi/2$
- None of the above

Accepted Answers:
$\frac{\pi}{2e^2}$