Assignment 12

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

- $5e^{i\pi/3}$
- $5e^{2i\pi/3}$
- $\sqrt{7}\exp(arctan(-4/3))$
- None of the above

**Accepted Answers:**

None of the above

2) The principal value of $\log(e^{2} + i)$ is

- 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

- $\log(3) + 3i\pi/2$
- $\infty$
- $\log 3 + i\pi$
- None of the above
4) Consider the complex function given by
\[ f(z) = \frac{z^2}{(z^2+1)} \]
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

5) Consider a complex function given by
\[ f(z) = \frac{1+z^2}{z(z-i)} \]
The point \( z = i \) is a
- simple pole
- pole of order 2
- regular point
- None of the above

6) The contour integral
\[ \int_C \frac{z}{z^2} \, dz \]
where \( C \) is a clockwise unit circle centered at \( z=2 \) is equal to
- 0
- \( i\pi e^{\pi/2} \)
- \(-i\pi e^{\pi/2} \)
- None of the above

7) The contour integral
\[ \int_C \frac{z^2}{(z^2+2)} \, dz \]
where \( C \) is a clockwise unit circle centered at \( z=0 \) is equal to
- 0
- 1/16
- \( i\pi/2 \)
- None of the above
8) The contour integral of the function
\[ \int_C \frac{z+2}{z^2+0.5} \, dz \]
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:
\( i\pi/2 \)

9) The integral
\[ \int_{-\infty}^{\infty} \frac{e^x}{x^2+4} \, dx \]
is equal to

- 0
- \( \frac{\pi}{2} \)
- \( \frac{i\pi}{2} \)
- \( ist/2 \)
- None of the above

Accepted Answers:
\( \frac{\pi}{2\pi^2} \)