I. Cloze 1、$\arg(-1-i)=$ ___ ,

2、$\mathrm{Re}\left(\frac{5i}{2+i}\right)=$ _____, $\left|\frac{5i}{2+i}\right|=$_____.

3、$\sqrt{1-i}=$ _______, $Ln(1+i)=$_____________.

4、The definition of e^z is _______.

5、The principle value of $(1+i)^i=$_________.

6、$\frac{d}{dz}(e^z\sin^3 z)=$__________________________.

7、If C denotes the circle centered at z_0 and integer number n>1, then $\int_C \frac{1}{(z-z_0)^n}dz=$ ________ .

8、The radius of convergence of $\sum_{n=1}^{\infty}(3n^3+2n+1)z^n$ is _____________.

9、The singular points of the function $f(z)=\frac{\cos^2 z}{z(z^2+3)}$ are __________________.

10 、 $z=2i$ is a pole of order__________of $f(z)=\frac{z-1}{z(z^2+4)^2}$.

11、$\oint_{|z|=2}\frac{zdz}{z-3}=$__________________.

II. Calculate the following integrals

1、$\int_{|z|=2}\frac{ze^z}{z^2-1}dz$ 2、$\int_{|z|=1}\frac{z^2-\sin z}{z^4}dz$

III. Given $f(z)=\int_C\frac{3\xi^2+4\xi+5}{\xi-z}d\xi$, where $C=\{z:|z|=4\}$, find $f'(2+i)$.

V. Find the Taylor expansion of $f(z)=\frac{1}{z^2}$ at $z=-1$.

VI. Find the Laurent expansion of $f(z)=\frac{1}{z^2-z-6}$ on the annulus (i) $2<|z|<3$, (ii) $0<|z+2|<5$