

Panel 1

Complex HW #18 and state which one you use!

① Use appropriate theorem to evaluate:

a) $\int_C \frac{ze^{z^3}}{(z-4)^2} dz$, C is circle centered at zero with radius 1

b) $\int_C \frac{z^2 \cos(z)}{(z-\pi)^2 (z-\pi/2)} dz$, C is a circle centered at zero with radius 2

c) $\int_C \frac{z^3 - 2z^2 + z}{(z-1)^5} dz$, C is a circle centered at zero with radius 3

Panel 2

② Find the Taylor series centered at $z_0 = 0$ (also called Maclaurin series) for the following functions:

a) $f(z) = \cosh(z)$ b) $g(z) = z^3 e^{(2z)}$ c) $h(z) = \frac{z^2}{1-z}$

③ Find the limit of the following series:

a) $\sum_{n=0}^{\infty} \left(\frac{i}{2}\right)^n$ b) $\sum_{n=4}^{\infty} \left(\frac{7}{10}\right)^n$ c) $\sum_{n=0}^{\infty} \frac{3^n}{n!}$

④ Find $\lim_{z \rightarrow 0} \frac{e^z - 1 - z}{z^2}$ without using l'Hospital's rule