

Ord: _____

Plex
MAA4402 2838

Class-B

Prof. JLF King
Wedn, 08Mar2023

Folks: For short-answer: Write **DNE** if the object does not exist or the operation cannot be performed.

NB: **DNE** $\neq \{\}$ $\neq 0$.

Below **C** is **Sph₇(0)**, the radius-7 origin-centered circle.

B1: Short answer. Show no work.

z The visual representation of $\mathbb{C}$ is sometimes called “the ? plane”, where ? is **Circle**: **Unreal** **Higher** **Snakes-on-a** **Argand** **Krypton** **Rayon** **Xenon** **Euler** **Goursat** **Liouville** **No-need-to-x** **y-com** **Air** **Sea** **De** **Rain-in-Spain-stays-mainly-on-the** .

a Define $f(x+iy) := xy + ix$. Let **L** be the line-segment from the origin to **2+i**. Then $\int_L f(z) dz =$.

b Integral

$\oint_C \frac{\cos(z^2)}{1-3z} dz =$.
[Hint: Rewrite, then use the Cauchy Integral Formula.]

c Value $\oint_C \frac{e^{3z}}{[z-2]^5} dz =$.
[Answer may be written as a product, using powers and factorials.]
[Hint: The GCIF works.]

d Fnc $u(x, y) := 2xy + x$ has harmonic conjugate $v(x, y) =$.

e Compute the real $\alpha =$ such that

$$*: 3^\alpha \cdot \sum_{k=0}^{4000} \binom{4000}{k} 2^k = \sum_{j=0}^{1995} \binom{1995}{j} 8^j.$$

[Hint: The Binomial Theorem]

B2: From class: “Function $f: (2, 5) \rightarrow \mathbb{R}$ is *uniformly continuous*” means [the formal, ϵ, δ defn]:

A particular fnc $g: (2, 5) \rightarrow \mathbb{R}$ which is *continuous*, but not *uniformly-cts* is $g(x) :=$.

B1: _____ 165pts

B2: _____ 45pts

Total: _____ 210pts

NAME: _____

HONOR CODE: “I have neither requested nor received help on this exam other than from my professor.”

Signature: _____