Problem 4.4

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Homework due Nov 14, 2020 19:00 EST

Problem 4.4

0.0/3.0 points (graded)

Let μ be a real number and D be an entire complex plane with the branchcut $z \in [0,1]$.

Given the function:

$$\varphi(z) = z^{\mu}(1-z)^{1-\mu}, \ \ \varphi\left(\frac{1}{2}+i0\right) = \frac{1}{2}.$$

Find:

1) $\varphi(2)$;

2) $\varphi(-1)$;

3) $\lim_{z\to\infty} \frac{\varphi(z)}{z}$.

Use i for complex unity, mu for μ and e^(#) for the exponential function. Present all the answers in the exponential form. Choose the arguments in such a way that for $\mu \in (0,1)$ the argument of the answer arg $\in (-\pi, \pi)$

1)

$\varphi(2) =$

2)

$\varphi(-1) =$

3)

Present the answer in the exponential form

$\lim_{z\to\infty} \frac{\varphi(z)}{z}$

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