MAT215: Complex Variables & Laplace Transformations

Quiz-01 (Set-A)

October 31, 2025

Total - 20 Marks

(You need to answer **All questions**, bonus will be considered if you didn't score the full)

Name:

ID:

Section:

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1. (a) Find all possible values of $z^{1/3}$ when $z = -8 - 8i$, and represent them geometrically in the complex plane.

   (b) Find the value of i^i. **Hint:** Use logarithms and exponent to handle the complex power.

(6+2 Marks)

2. (a) Sketch and describe the region represented by

$$|z - 1| < 2|z + 1|.$$

   (b) Determine all values of z that satisfy

$$\mathrm{Re}(z^2) = 2\ \mathrm{Im}(z).$$

   Sketch the corresponding curve in the complex plane.

(6+6 Marks)

Bonus Question:

1. Find the image of the unit square under the mapping $f(z) = (1+i)z + i$, (2 Marks)

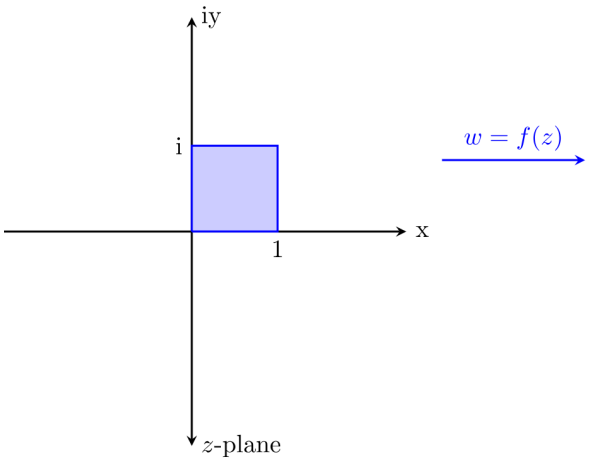

Figure 1: $f(z) = (1+i)z + i$

Best of Luck!