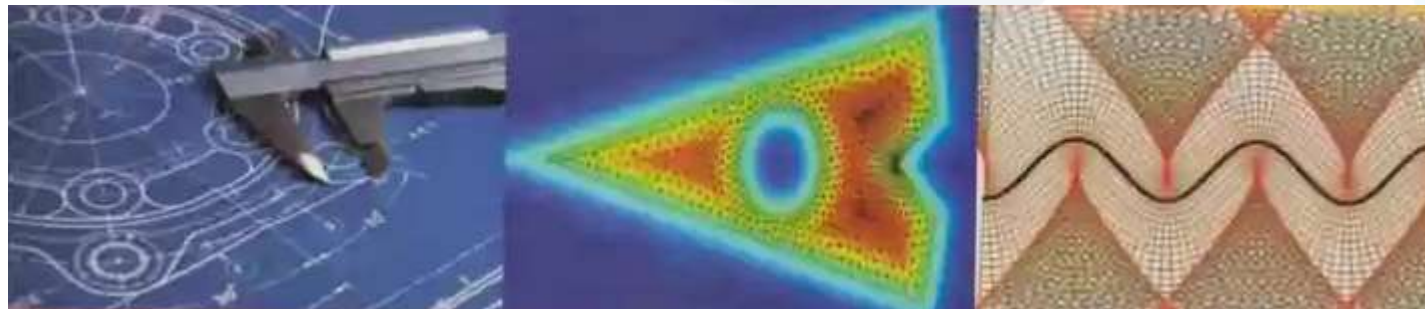


CEDC301: Mathematics Engineering

Exercises 2: Functions of a Complex Variable: Part B



Ramez Koudsieh, Ph.D.

Faculty of Engineering

Department of Robotics and Intelligent Systems

Manara University

1. Find all values of z satisfying the given equation

$$e^z - 1 = -ie^2 \qquad e^{2z} + e^z + 1 = 0$$

2. Find all values of the given quantity

$$(1 + i)^{(1 + i)} \qquad (1 + \sqrt{3}i)^{3i}$$

3. Find all values of z satisfying the given equation

$$\sin z = 2 \qquad \cos z = -3i \qquad \sinh z = -i \qquad \cos z = \sin z \qquad \cos z = i \sin z$$

4. Verify that $(i^i)^2 = i^{2i}$, but $(i^2)^i \neq i^{2i}$

5. Find where $\tan^{-1} z = \frac{i}{2} \ln \frac{i + z}{i - z}$ is analytic?

6. Find the derivative of the principal value of the given function at the given point.

$$z^{3/2}; z = 1 + i$$

$$z^{1+i}; z = 1 + \sqrt{3}i$$

7. Find all values of the given quantity

$$\sinh^{-1} i$$

$$\tanh^{-1}(i + 1)$$