

Eskişehir Osmangazi University - Electrical Engineering Department
Advanced Calculus

1st Midterm Examination - Fall 2011

!!! For each problem put the answer next to it !!!

1. [60 pts.] Evaluate:

$$(3 + i)/i^3 = \mathbf{3i-1}$$

$$2i/(1 + i) = \mathbf{1+i}$$

$$|2 + i| = \sqrt{5}$$

$$\overline{(2 + i)}/2 = \mathbf{1 - 0.5i}$$

$$\log(2 + 2i) = \mathbf{1.04 + 0.79i + 2\pi ni, \ n = 0, \pm 1, \dots}$$

$$\text{Log}(2 + 2i) = \mathbf{1.04 + 0.79i}$$

$$\sin(2 + 2i) = \mathbf{3.42 - 1.50i}$$

$$e^{\log(1+i)} = \mathbf{1 + i}$$

$$\log e^{1+i} = \mathbf{1 + i + 2\pi ni, \ n = 0, \pm 1, \dots}$$

$$\text{Log} e^{1+i} = \mathbf{1 + i}$$

$$\text{Arg}(1 - i) = \mathbf{-\frac{\pi}{4}}$$

$$\text{Arg}(-1 - i) = \mathbf{-\frac{3\pi}{4}}$$

2. [20 pts.] Evaluate:

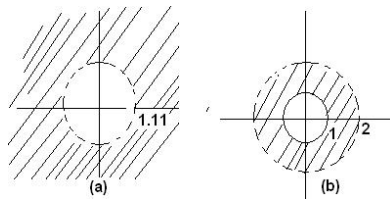
$$\frac{d}{dz}(x^2 - y^2 + 5x + i(2xy + y))$$

C-R equations are not satisfied, therefore, the function above is not differentiable.

3. [20 pts.] Sketch:

(a) $|2z| > |2 + i|$

(b) $1 \leq |z| < 2$



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