

Final Exam
Academic Year 1442-1443 Hijri- Second Semester

Exam Information معلومات الامتحان		
Course name	Complex analysis	
Course Code	رياض 487	
Exam Date	2022-06-01	1443-11-02
Exam Time	01: 00 PM	
Exam Duration	3 hours	ثلاث ساعات
Classroom No.	G019	
Instructor Name	د. هيفاء طحلاوي	

Student Information معلومات الطالب		
Student's Name	اسم الطالب	
ID number	الرقم الجامعي	
Section No.	رقم الشعبة	
Serial Number	الرقم التسلسلي	

General Instructions:

- Your Exam consists of PAGES (except this paper)
 - Keep your mobile and smart watch out of the classroom.
- تعليمات عامة:
- عدد صفحات الامتحان صفحة. (باستثناء هذه الورقة)
 - يجب ابقاء الهواتف والساعات الذكية خارج قاعة الامتحان.

هذا الجزء خاص بأستاذ المادة

This section is ONLY for instructor

#	Course Learning Outcomes (CLOs)	Related Question (s)	Points	Final Score
1				
2				
3				
4				
5				
6				
7				
8				

Answer all of the following questions, please make sure that your hand writing is clear:

QI. For all complex numbers z , show that $\sqrt{2} z \geq |Re z| + |Im z|$. When do we have equality?

QII. Use de Moivre's formula to find $(\sqrt{3} - i)^{100}$.

QIII. Write the Cauchy-Riemann equations in $x - y$ coordinates. Derive the polar form of C-R equations and use it to show that $Log z$, is analytic. State the maximal possible domain of analyticity, then find the derivative and justify your answer.

QIV. Find all complex numbers z , such that $\cos z = 2$.

QV. State the Cauchy integral formula and then prove it.

QVI. Let $f(z) = \frac{\cosh z^2 - 1}{z^4}$. Show that $z = 0$ is a removable isolated singularity. Then find $f^{(80)}(0)$.

QVII. Use Residue Theorem to calculate

$$\int_0^{\infty} \frac{dx}{x^4 + 1}$$

QVIII. Use residues to calculate

$$\int_{-\infty}^{\infty} \frac{x \sin x}{x^4 + 4} dx$$