جامعة الملك عبدالعزيز

كلية العلوم - قسم الرياضيات

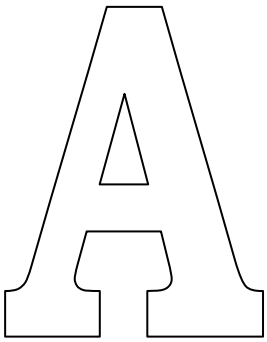
الاسم:_____

الرقم الجامعي:_____

Math 202-Calculus 2

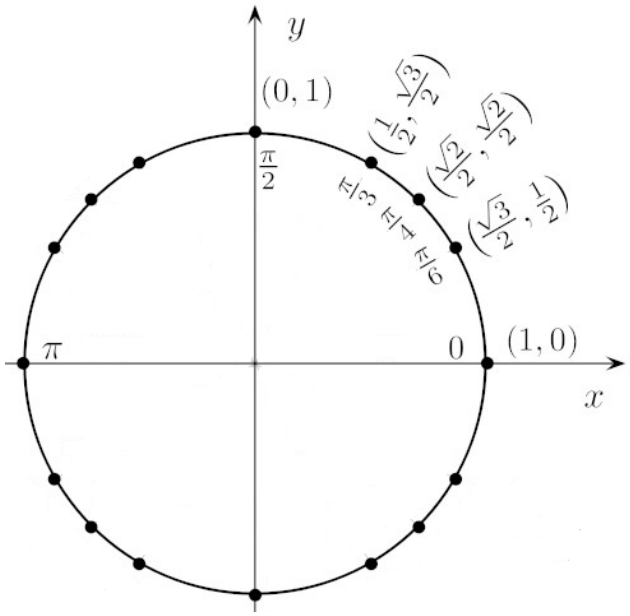
Second Exam

Date: Sunday 18 / 6 / 1434
Time: from 19:00 to 20:30



- تأكد من أن رمز نموذج الإجابة لديك هو A .
- أكتب اسمك على هذا النموذج ثم تأكد من تعبئة جميع بيانات نموذج الإجابة **خاصة رقمك الجامعي و بقلم الرصاص.**
- تأكد من تعبئة نموذج الحضور بصورة صحيحة.
- أجب عن جميع الأسئلة الآتية بتظليل الخيار الصحيح في نموذج الإجابة **بقلم الرصاص**.
- ممنوع استخدام الآلة الحاسبة.

هذه الصفحة تتضمن بعض القوانين التي قد تحتاجها لحل بعض أسئلة هذا الامتحان.



The Unit Circle

$\sin mx \sin nx = \frac{1}{2}[\cos(m-n)x - \cos(m+n)x]$	$\cos^2\theta = \frac{1+\cos 2\theta}{2}$
$\sin mx \cos nx = \frac{1}{2}[\sin(m-n)x + \sin(m+n)x]$	$\sin^2\theta = \frac{1-\cos 2\theta}{2}$
$\cos mx \cos nx = \frac{1}{2}[\cos(m-n)x + \cos(m+n)x]$	$\sin 2\theta = 2\sin\theta\cos\theta$
$\int \frac{dx}{x^2+a^2} = \frac{1}{a}\tan^{-1}\left(\frac{x}{a}\right) + C$	$\int \frac{dx}{\sqrt{a^2-x^2}} = \sin^{-1}\left(\frac{x}{a}\right) + C$
$\int \frac{u\,du}{\sqrt{a+bu}} = \frac{2}{3b^2}(bu-2a)\sqrt{a+bu} + C$	$\int e^{au}\sin bu\ du = \frac{e^{au}}{a^2+b^2}(a\sin bu - b\cos bu) + C$
$\int \frac{du}{u^2(a+bu)} = -\frac{1}{au} + \frac{b}{a^2}\ln\left\lvert\frac{a+bu}{u}\right\rvert + C$	$\int u^n \ln u\ du = \frac{u^{n+1}}{(n+1)^2}[(n+1)\ln(u) - 1] + C$

Q1. $\int \csc x \ \ dx = \ln\lvert\csc x - \cot x\rvert + c$	
(A) True	(B) False

Q2. $\int \sin^2 x \ dx =$	
(A) $\frac{1}{2}x - \cos(2x) + c$	(B) $\frac{1}{2}x - \frac{1}{4}\sin(2x) + c$
(C) $\frac{1}{2}x + \frac{1}{4}\sin(2x) + c$	(D) $x - \frac{1}{4}\cos(2x) + c$

Q3. $\int \sin^3 x \cos^2 x \, dx =$	
(A) $-\frac{1}{3}\cos^3 x - \cos^5 x + c$	(B) $\frac{1}{3}\cos^3 x - \frac{1}{5}\cos^5 x + c$
(C) $-\frac{1}{3}\cos^3 x + \frac{1}{5}\cos^5 x + c$	(D) $-\frac{1}{3}\cos^3 x - \frac{1}{5}\cos^5 x + c$

- السؤال رقم (4)هو تكرار للسؤال رقم (3)

Q4. $\int \sin^3 x \cos^2 x \, dx =$	
(A) $-\frac{1}{3}\cos^3 x - \cos^5 x + c$	(B) $\frac{1}{3}\cos^3 x - \frac{1}{5}\cos^5 x + c$
(C) $-\frac{1}{3}\cos^3 x + \frac{1}{5}\cos^5 x + c$	(D) $-\frac{1}{3}\cos^3 x - \frac{1}{5}\cos^5 x + c$

Q5. $\int \tan^4 x \ \sec^2 x \ dx =$			
(A) $\frac{1}{5}\tan^5 x + c$	(B) $-\frac{1}{5}\tan^5 x + c$	(C) $\tan^5 x + c$	(D) $\frac{\tan^5 x}{5} \ \frac{\sec^3 x}{3} + c$

Q6. $\int \cot^3 x \ \csc^3 x \ dx =$	
(A) $\csc^3 x - \frac{1}{3}\csc^5 x + c$	(B) $\frac{1}{3}\csc^3 x + \frac{1}{5}\csc^5 x + c$
(C) $\frac{1}{3}\csc^3 x - \frac{1}{5}\csc^5 x + c$	(D) $\frac{1}{4}\cot^4 x + \frac{1}{4}\csc^4 x + c$

Q7. $\int \cos(5x)\cos(4x) \ dx =$	
(A) $\frac{1}{9}\sin(9x) + \frac{1}{2}\sin(x) + c$	(B) $\frac{1}{18}\sin(9x) + \frac{1}{2}\sin(x) + c$
(C) $\frac{1}{18}\sin(9x) + \sin(x) + c$	(D) $\frac{1}{18}\sin(9x) - \frac{1}{2}\sin(x) + c$

Q8. $\int \frac{\sqrt{1-x^2}}{x^2} \ dx =$	
(A) $\frac{\sqrt{1-x^2}}{x} - \sin^{-1} x + c$	(B) $-\frac{\sqrt{1-x^2}}{x} - \sin^{-1} x + c$
(C) $-\frac{\sqrt{1-x^2}}{x} + \sin^{-1} x + c$	(D) $\frac{\sqrt{1-x^2}}{x} + \sin^{-1} x + c$

Q9. $\int \frac{1}{\sqrt{x^2+1}}\, dx =$	
(A) $\ln\lvert \sqrt{1-x^2}+x\rvert + c$	(B) $\ln\lvert \sqrt{1+x^2}-x\rvert + c$
(C) $\ln\lvert \sqrt{1+x^2}+x\rvert + c$	(D) $\sqrt{1+x^2}+c$

Q10. $\int \frac{1}{\sqrt{8-2x-x^2}}\, dx =$	
(A) $\sin^{-1}(\frac{x+1}{3})+c$	(B) $\sin^{-1}(\frac{x-1}{3})+c$
(C) $\cos^{-1}(\frac{x+1}{3})+c$	(D) $\tan^{-1}(\frac{x+1}{3})+c$

Q11. $\int \frac{x}{\sqrt{x^2+25}} dx =$	
(A) $\sqrt{x^2+25}+c$	(B) $\sqrt{x^2+5}+c$
(C) $\ln(x^2+25)+c$	(D) $\frac{1}{2}\ln(x^2+25)+c$

Q12.

The form of the partial fraction decomposition of the rational function $\frac{1}{(x+1)^2(x^2+5)}$ is

(A) $\frac{Ax+B}{(x+1)^2}+\frac{Cx+D}{x^2+5}$	(B) $\frac{A}{(x+1)}+\frac{B}{(x+1)^2}+\frac{Cx}{x^2+5}$
(C) $\frac{A}{(x+1)}+\frac{B}{(x+1)^2}+\frac{Cx+D}{x^2+5}$	(D) $\frac{A}{(x+1)}+\frac{Cx+D}{x^2+5}$

Q13.

$\int \frac{x^2}{x+1}dx =$

(A) $\frac{1}{2}x^2-x-\ln\lvert x+1\rvert+c$	(B) $\frac{1}{2}x^2+x+\ln\lvert x+1\rvert+c$
(C) $x^2-x+\ln\lvert x+1\rvert+c$	(D) $\frac{1}{2}x^2-x+\ln\lvert x+1\rvert+c$

Q14.

$\int \frac{1}{(x-4)(x-8)}dx =$

(A) $\frac{1}{8}\ln\lvert x-8\rvert-\frac{1}{4}\ln\lvert x-4\rvert+c$	(B) $\frac{1}{4}\ln\lvert x-8\rvert+\frac{1}{4}\ln\lvert x-4\rvert+c$
(C) $\frac{1}{4}\ln\lvert x-8\rvert-\frac{1}{4}\ln\lvert x-4\rvert+c$	(D) $\frac{1}{4}\ln\lvert x-8\rvert-\frac{1}{8}\ln\lvert x-4\rvert+c$

السؤال رقم (15)هو تكرار للسؤال رقم (14)

Q15.

$$\int \frac{1}{(x-4)(x-8)}\,dx =$$

(A) $\frac{1}{8}\ln\|x-8\| - \frac{1}{4}\ln\|x-4\| + c$	(B) $\frac{1}{4}\ln\|x-8\| + \frac{1}{4}\ln\|x-4\| + c$
(C) $\frac{1}{4}\ln\|x-8\| - \frac{1}{4}\ln\|x-4\| + c$	(D) $\frac{1}{4}\ln\|x-8\| - \frac{1}{8}\ln\|x-4\| + c$

Q16.

$$\int \frac{1}{x^2(x-1)}\,dx =$$

(A) $\frac{1}{x} - \ln\|x\| - \ln\|x-1\| + c$	(B) $\frac{1}{x} + \ln\|x\| - \ln\|x-1\| + c$
(C) $-\frac{1}{x} - \ln\|x\| - \ln\|x-1\| + c$	(D) $\frac{1}{x} - \ln\|x\| + \ln\|x-1\| + c$

Q17.

By using the formula

$$\int \frac{u\,du}{\sqrt{a+bu}} = \frac{2}{3b^2}(bu-2a)\sqrt{a+bu} + C$$

The integral

$$\int \frac{x\,dx}{\sqrt{1+2x}} =$$

(A) $\frac{1}{6}(x-1)\sqrt{1+2x} + c$	(B) $\frac{1}{3}(x-1)\sqrt{1+2x} + c$
(C) $\frac{1}{3}(2x-1)\sqrt{1-2x} + c$	(D) $\frac{1}{6}(x+1)\sqrt{1+2x} + c$

Q18. $\int e^{\sqrt{x}}dx =$	
(A) $2\left(\sqrt{x}+1\right)e^{\sqrt{x}}+c$	(B) $\left(\sqrt{x}-1\right)e^{\sqrt{x}}+c$
(C) $\left(\sqrt{x}+1\right)e^{\sqrt{x}}+c$	(D) $2\left(\sqrt{x}-1\right)e^{\sqrt{x}}+c$

Q19. $\int_2^{\infty} \frac{1}{x^3}dx =$				
(A) 1	(B) $\frac{1}{4}$	(C) $\frac{1}{8}$	(D) $\frac{1}{2}$	(E) $\frac{1}{64}$

Q20. $\int \tan x \ dx =$		
(A) $\sec^2 x + C$	(B) $\frac{\tan^2 x}{2} + C$	(C) $\ln\lvert\sec x\rvert + C$
(D) $\ln\lvert\sin x\rvert + C$	(E) $\ln\lvert\sec x + \tan x\rvert + C$	

السؤال رقم (21) هو تكرار للسؤال رقم (20)

Q21. $\int \tan x \ dx =$		
(A) $\sec^2 x + C$	(B) $\frac{\tan^2 x}{2} + C$	(C) $\ln\lvert\sec x\rvert + C$
(D) $\ln\lvert\sin x\rvert + C$	(E) $\ln\lvert\sec x + \tan x\rvert + C$	

Q22.

Use the formula

$$\int e^{au} \sin bu \ du = \frac{e^{au}}{a^2 + b^2}(a \sin bu - b \cos bu) + c$$

To evaluate

$$\int e^{3x} \sin(4x)\, dx =$$

(A) $\frac{1}{25} e^{3x}(3 \sin(4x) - 4 \cos(4x)) + c$	(B) $\frac{1}{25} e^{3x}(4 \sin(4x) - 4 \cos(4x)) + c$
(C) $\frac{1}{25} e^{3x}(3 \sin(4x) + 4 \cos(4x)) + c$	(D) $\frac{1}{5} e^{3x}(3 \sin(4x) - 4 \cos(4x)) + c$

السؤال رقم (23) هو تكرار للسؤال رقم (22)

Q23.

Use the formula

$$\int e^{au} \sin bu \ du = \frac{e^{au}}{a^2 + b^2}(a \sin bu - b \cos bu) + c$$

To evaluate

$$\int e^{3x} \sin(4x)\, dx =$$

(A) $\frac{1}{25} e^{3x}(3 \sin(4x) - 4 \cos(4x)) + c$	(B) $\frac{1}{25} e^{3x}(4 \sin(4x) - 4 \cos(4x)) + c$
(C) $\frac{1}{25} e^{3x}(3 \sin(4x) + 4 \cos(4x)) + c$	(D) $\frac{1}{5} e^{3x}(3 \sin(4x) - 4 \cos(4x)) + c$

Q24. $\int_2^{11} \frac{1}{\sqrt{x-2}}\,dx =$				
(A) 1	(B) 3	(C) 5	(D) 4	(E) 6

Q25. $\int \frac{1}{x^2+5}\,dx =$	
(A) $\tan^{-1}(\frac{x}{\sqrt{5}})$+c	(B) $\tan^{-1}(\frac{x}{5}) + c$
(C) $\frac{1}{\sqrt{5}}\tan^{-1}(\frac{x}{\sqrt{5}})$+c	(D) $\frac{1}{5}\tan^{-1}(\frac{x}{5}) + c$