جامعة الملك عبدالعزيز.

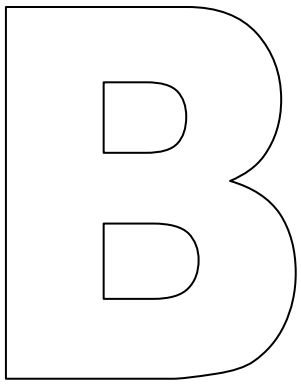
كلية العلوم. الاسم:_____

قسم الرياضيات. الرقم الجامعي:_____

math 202.
Calculus 2.

Second Exam

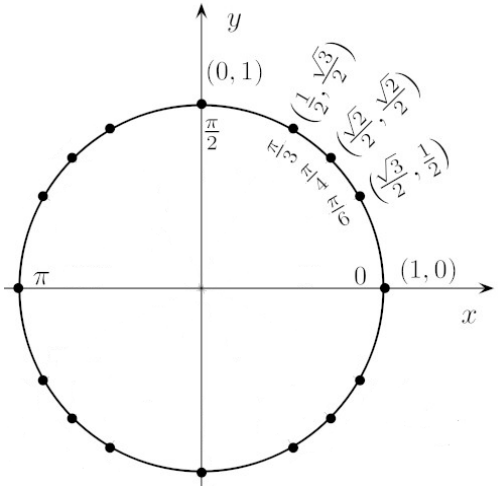
Date: Sunday 1 / 6 / 1433 H.
Time: from 20:45 to 22:15.

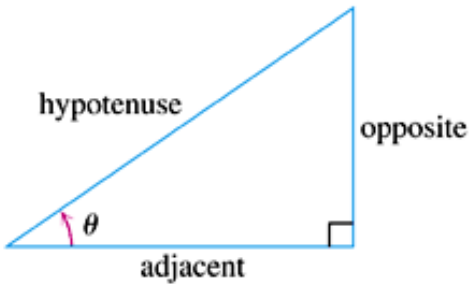


- تأكد من أن رمز نموذج الإجابة لديك هو B.
- أكتب اسمك على هذا النموذج ثم تأكد من تعبئة جميع بيانات نموذج الإجابة **خاصة رقمك الجامعي و بقلم الرصاص.**
- تأكد من تعبئة نموذج الحضور بصورة صحيحة.
- أجب عن جميع الأسئلة الآتية بتظليل الخيار الصحيح في نموذج الإجابة **بقلم الرصاص**.
- ممنوع استخدام الآلة الحاسبة.

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

The Unit Circle





$$\sin\theta = \frac{\text{opp}}{\text{hyp}} \qquad \csc\theta = \frac{\text{hyp}}{\text{opp}}$$

$$\cos\theta = \frac{\text{adj}}{\text{hyp}} \qquad \sec\theta = \frac{\text{hyp}}{\text{adj}}$$

$$\tan\theta = \frac{\text{opp}}{\text{adj}} \qquad \cot\theta = \frac{\text{adj}}{\text{opp}}$$

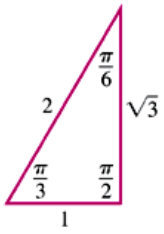
$$\sin 2\theta = 2\sin\theta\cos\theta$$

$$\sin^2\theta = \frac{1}{2}(1 - \cos 2\theta)$$

$$\sin A\ \cos B = \frac{1}{2}[\sin(A-B) + \sin(A+B)]$$

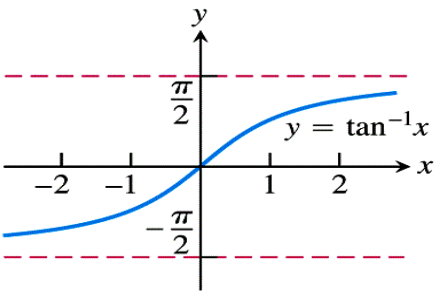
$$\sin A\ \sin B = \frac{1}{2}[\cos(A-B) - \cos(A+B)]$$

$$\cos A\ \cos B = \frac{1}{2}[\cos(A-B) + \cos(A+B)]$$



$$\sinh x = \frac{1}{2}(e^x - e^{-x})$$

$$\cosh x = \frac{1}{2}(e^x + e^{-x})$$



$$\int \frac{du}{\sqrt{2au - u^2}} = \cos^{-1}\left(\frac{a-u}{a}\right) + C$$

$$\int \frac{udu}{\sqrt{2au - u^2}} = -\sqrt{2au - u^2} + a\cos^{-1}\left(\frac{a-u}{a}\right) + C$$

$$\int \frac{u^2 du}{\sqrt{2au - u^2}} = -\frac{(u+3a)}{2}\sqrt{2au - u^2} + \frac{3a^2}{2}\cos^{-1}\left(\frac{a-u}{a}\right) + C$$

$$\int \frac{du}{u\sqrt{2au - u^2}} = -\frac{\sqrt{2au - u^2}}{au} + C$$

Q1. Similar to example 4, page 455

$$\int e^x \cos x \; dx =$$

(A) $\frac{e^{x+1}}{x+1}\sin x + C$	(B) $\frac{1}{2}e^x(\sin x + \cos x) + C$
(C) $e^x \sin x + C$	(D) $\frac{1}{2}e^x(\sin x - \cos x) + C$

Q2. Similar to problem 21, page 457

$$\int_0^1 x \sinh x \; dx =$$

(A) $-\frac{2}{e}$	(B) $\frac{2}{e}$	(C) $\frac{1}{e}$	(D) $-\frac{1}{e}$	(E) $1 - e$

Q3. Similar to example 9, page 465

$$\int \cos 4x \sin 3x \; dx =$$

(A) $\frac{\sin x}{2} - \frac{\sin 7x}{14} + C$	(B) $\frac{\sin x}{2} + \frac{\sin 7x}{14} + C$	(C) $\frac{\cos x}{2} + \frac{\cos 7x}{14} + C$
(D) $-\frac{\cos x}{2} - \frac{\cos 7x}{14} + C$	(E) $\frac{\cos x}{2} - \frac{\cos 7x}{14} + C$	

Q4. Problem 1, page 465

$$\int \cos^3 x \sin^2 x \, dx =$$

(A) $\frac{\cos^3 x}{3} - \frac{\cos^5 x}{5} + C$	(B) $\frac{\sin^5 x}{5} - \frac{\sin^3 x}{3} + C$	(C) $-\frac{\cos^5 x}{5} - \frac{\cos^3 x}{3} + C$
(D) $\frac{\sin^3 x}{3} - \frac{\sin^5 x}{5} + C$	(E) $\frac{\sin^5 x}{5} + \frac{\sin^3 x}{3} + C$	

Q5. To evaluate $\int \frac{\sqrt{x^2-25}}{x^3} \, dx$, $x > 5$, using Trigonometric substitution, we let

(A) $x = 5\sin\theta, \; -\frac{\pi}{2} < \theta < \frac{\pi}{2}$	(B) $x = 5\tan\theta, \; -\frac{\pi}{2} < \theta < \frac{\pi}{2}$
(C) $x = 5\cosh\theta$	(D) $x = 5\sec\theta, \; 0 < \theta < \frac{\pi}{2}$

Q6.

$$\int \frac{\sqrt{x^2-25}}{x^3}\,dx =$$

(A) $\frac{1}{10}\sec^{-1}\left(\frac{x}{5}\right)-\frac{\sqrt{x^2-25}}{2x^2}+C$	(B) $\frac{1}{5}\sin^{-1}\left(\frac{x}{5}\right)-\frac{\sqrt{x^2-25}}{2x^2}+C$
(C) $\frac{1}{2}\tan^{-1}\left(\frac{x}{5}\right)-\frac{\sqrt{x^2-25}}{2x^2}+C$	(D) $\frac{1}{5}\sec^{-1}\left(\frac{x}{5}\right)-\frac{\sqrt{x^2-25}}{x^2}+C$

Q7. Problem 18, page 482.

The form of the partial fraction decomposition of $\frac{x^2+2x-1}{x(x+1)(x-1)}$ is $\frac{A}{x}+\frac{B}{x+1}+\frac{C}{x-1}$. Solving for $A, B,$ and $C,$ we get

(A) $A=1,\ B=-1,\ C=-1$	(B) $A=1,\ B=-1,\ C=1$	(C) $A=-1,\ B=-1,\ C=1$	(D) $A=-1,\ B=1,\ C=-1$

Q8. Problem 18, page 482.

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

(A) $\ln\lvert x\rvert-\ln\lvert x+1\rvert-\ln\lvert x-1\rvert+C$	(B) $\ln\lvert x\rvert-\ln\lvert x+1\rvert+\ln\lvert x-1\rvert+C$
(C) $-\ln\lvert x\rvert-\ln\lvert x+1\rvert+\ln\lvert x-1\rvert+C$	(D) $-\ln\lvert x\rvert+\ln\lvert x+1\rvert-\ln\lvert x-1\rvert+C$

Q9.

$$\int \frac{x^2\,dx}{\sqrt{6x-x^2}} =$$

Hint: Use a suitable formula from the second page.

(A) $\cos^{-1}\left(\frac{3-x}{3}\right)+C$	(B) $-\frac{\sqrt{6x-x^2}}{3x}+C$
(C) $-\frac{(x+9)}{2}\sqrt{6x-x^2}+\frac{27}{2}\cos^{-1}\left(\frac{3-x}{3}\right)+C$	(D) $-\sqrt{6x-x^2}+3\cos^{-1}\left(\frac{3-x}{3}\right)+C$

Q10. problem 13, page 515

The improper integral $\int_{-\infty}^{\infty} xe^{-x^2}\,dx$

Hint: Take $u=x^2$.

(A) converges to $\frac{1}{2}$	(B) converges to $-\frac{1}{2}$	(C) diverges	(D) converges to 0

Q11. Problem 24, page 515

$$\int_0^{\infty} \frac{e^x}{e^{2x}+3}\,dx =$$

(A)	(B)	(C)	(D)	(E)
$\frac{\pi\sqrt{3}}{9}$	$\frac{\sqrt{3}}{9}$	$\frac{\pi}{9}$	$\frac{\pi+\sqrt{3}}{9}$	$\frac{\pi-\sqrt{3}}{9}$

Q12.

$$\int_1^5 \frac{x+7}{x^2+5x-14}\,dx =$$

(A)	(B)	(C)	(D)	(E)
$\ln 4$	$\ln 3$	$\ln 2$	3	divergent

Q13. Problem 17, page 466.

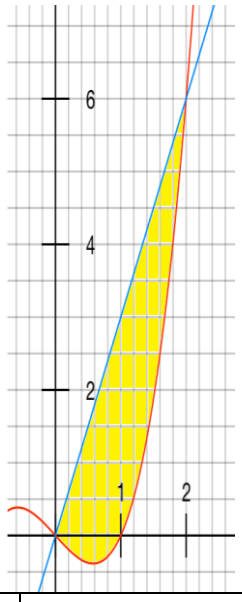
$$\int \cos^2 x \, \tan^3 x \, dx =$$

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

تم إلغاء هذا السؤال للتعديل الذي حدث في منهج الدوري الثاني.

Q13. problem 16, page 420

The area enclosed between the graphs $y = x^3 - x$ and $y = 3x$ where $x \geq 0$ is



(A)	(B)	(C)	(D)
9	8	4 correct	3

Answers to the second exam

1 / 6 / 1433H

B

1	B
2	C
3	E
4	D
5	D
6	A
7	B
8	B
9	C
10	D
11	A
12	E
13	C