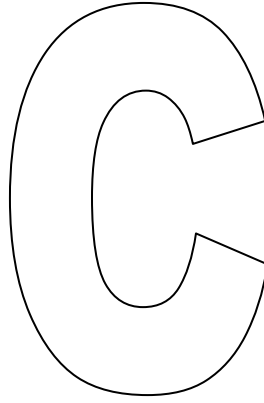


math 202.
Calculus 2.

Final Exam

Date: Monday 4 / 7 / 1432.
Time: from 08:00 to 10:00.



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

Q1. $\sum_{k=1}^{50}(2k - 10) =$				
(A) 20500	(B) 3050	(C) 2050	(D) 2540	(E) 2560

Q2. If h is even on $\mathbb{R}$ and $\int_{-4}^4 h(x)dx = \frac{\pi}{3}$, then $\int_{-4}^0 h(x)dx =$				
(A) $\frac{\pi}{6}$	(B) $\frac{\pi}{2}$	(C) $\frac{\pi}{12}$	(D) $\frac{\pi}{4}$	

Q3. $\frac{d}{dx} \left(\int_2^x \frac{\coth^{-1} t}{t} dt \right) =$			
(A) $\frac{1}{1-x^2}$	(B) $\frac{1}{1-x}$	(C) $\frac{\cot^{-1} x}{x}$	(D) $\frac{\coth^{-1} x}{x}$

Q4. If $f(x) > 2$ for all $x \in [a, b]$, then the area of the region bounded by the graph of f , the x -axis, and the vertical lines $x = a$ and $x = b$ is $\int_a^b f(x)dx$.	
(A) T R U E	(B) F A L S E

Q5. $\int \frac{8x^3+4x-2}{\sqrt[5]{x^4+x^2-x}} dx =$	
(A) $\frac{5}{4} \sqrt[5]{(x^4+x^2-x)^4} + C$	(B) $\frac{5}{2} \sqrt[5]{(x^4+x^2-x)^4} + C$
(C) $\frac{5}{2} \sqrt[4]{(x^4+x^2-x)^5} + C$	(D) $\frac{5}{4} \sqrt[4]{(x^4+x^2-x)^5} + C$

Q6. The area of the region bounded by the graph of $y = \frac{1}{\sqrt{1-x^2}}$ and the x -axis over the closed interval $\left[\frac{1}{2}, \frac{\sqrt{2}}{2}\right]$ is			
(A) $\frac{\pi}{2}$	(B) $\frac{\pi}{6}$	(C) $\frac{\pi}{12}$	(D) $\frac{\pi}{6}$

السؤال رقم 7 هو تكرار للسؤال رقم 6 و يجب أن تجيب عليه للحصول على درجته

Q7.

The area of the region bounded by the graph of $y = \frac{1}{\sqrt{1-x^2}}$ and the x -axis over the closed interval $\left[\frac{1}{2}, \frac{\sqrt{2}}{2}\right]$ is

(A)

$$\frac{\pi}{2}$$

(B)

$$\frac{\pi}{6}$$

(C)

$$\frac{\pi}{12}$$

(D)

$$\frac{\pi}{6}$$

Q8.

The area between the curves $f(x) = x^4$ and $g(x) = x^5$ is

(A)

$$\frac{1}{18}$$

(B)

$$\frac{3}{25}$$

(C)

$$\frac{1}{32}$$

(D)

$$\frac{1}{30}$$

(E)

$$\frac{1}{24}$$

السؤال رقم 9 هو تكرار للسؤال رقم 8 و يجب أن تجيب عليه للحصول على درجته

Q9.

The area between the curves $f(x) = x^4$ and $g(x) = x^5$ is

(A)

$$\frac{1}{18}$$

(B)

$$\frac{3}{25}$$

(C)

$$\frac{1}{32}$$

(D)

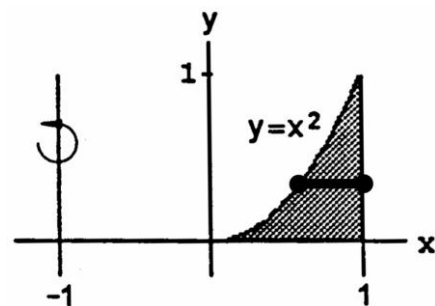
$$\frac{1}{30}$$

(E)

$$\frac{1}{24}$$

Q10.

The volume of the solid generated by revolving the region in the first quadrant bounded by the curve $y = x^2$, the x -axis, and the line $x = 1$, about the line $x = -1$ is



Hint: $R(y) = 2$ and $r(y) = 1 + \sqrt{y}$.

(A)

$$\frac{7\pi}{6}$$

(B)

$$\frac{7\pi}{3}$$

(C)

$$\pi$$

(D)

$$\frac{7\pi}{5}$$

(E)

$$\frac{7\pi}{4}$$

السؤال رقم 11 هو تكرار للسؤال رقم 10 و يجب أن تجيب عليه للحصول على درجته

Q11.

The volume of the solid generated by revolving the region in the first quadrant bounded by the curve $y = x^2$, the x -axis, and the line $x = 1$, about the line $x = -1$ is

(A)

$$\frac{7\pi}{6}$$

(B)

$$\frac{7\pi}{3}$$

(C)

$$\pi$$

(D)

$$\frac{7\pi}{5}$$

(E)

$$\frac{7\pi}{4}$$

Q12. The length of the curve $y = \ln \cos x$ over $\left[0, \frac{\pi}{3}\right]$ is				
(A) $\ln\left(\frac{2+\sqrt{3}}{2}\right)$	(B) $\ln(2 + \sqrt{3})$	(C) $\ln \sqrt{3}$	(D) $\sqrt{3}$	(E) $2 + \sqrt{3}$

السؤال رقم 13 هو تكرار للسؤال رقم 12 و يجب أن تجيب عليه للحصول على درجته

Q13. The length of the curve $y = \ln \cos x$ over $\left[0, \frac{\pi}{3}\right]$ is				
(A) $\ln\left(\frac{2+\sqrt{3}}{2}\right)$	(B) $\ln(2 + \sqrt{3})$	(C) $\ln \sqrt{3}$	(D) $\sqrt{3}$	(E) $2 + \sqrt{3}$

Q14. If $f(x) = x^2 + 5x - 6$; $x \geq -\frac{5}{2}$, then $(f^{-1})'(6) =$			
(A) 5	(B) $\frac{1}{5}$	(C) -5	(D) $\frac{1}{5}$

Q15. If $f(x) = x^5 - 2$, then $f^{-1}(x) =$			
(A) $\sqrt[5]{x+2}$	(B) $\sqrt[5]{x-2}$	(C) $\sqrt[5]{x} + 2$	(D) $\frac{1}{x^5} + 2$

Q16. If $y = \frac{(x^3-3)(e^{2x})(\sinh x)}{\sqrt{x^2+1}}$, then $y' = \frac{dy}{dx} =$	
(A) $\left(\frac{(x^3-3)(e^{2x})(\sinh x)}{\sqrt{x^2+1}}\right) \left(\frac{3x^2}{x^3-3} + 2 + \coth x + \frac{x}{x^2+1}\right)$	(B) $\left(\frac{(x^3-3)(e^{2x})(\sinh x)}{\sqrt{x^2+1}}\right) \left(\frac{3x^2}{x^3-3} + 2 + \tanh x + \frac{x}{x^2+1}\right)$
(C) $\left(\frac{(x^3-3)(e^{2x})(\sinh x)}{\sqrt{x^2+1}}\right) \left(\frac{3x^2}{x^3-3} + 2 + \coth x - \frac{2x}{x^2+1}\right)$	(D) $\left(\frac{(x^3-3)(e^{2x})(\sinh x)}{\sqrt{x^2+1}}\right) \left(\frac{3x^2}{x^3-3} + 2 + \tanh x - \frac{x}{x^2+1}\right)$
(E) $\left(\frac{(x^3-3)(e^{2x})(\sinh x)}{\sqrt{x^2+1}}\right) \left(\frac{3x^2}{x^3-3} + 2 + \coth x - \frac{x}{x^2+1}\right)$	

السؤال رقم 17 هو تكرار للسؤال رقم 16 و يجب أن تجيب عليه للحصول على درجته

Q17. If $y = \frac{(x^3-3)(e^{2x})(\sinh x)}{\sqrt{x^2+1}}$, then $y' = \frac{dy}{dx} =$	
(A) $\left(\frac{(x^3-3)(e^{2x})(\sinh x)}{\sqrt{x^2+1}}\right) \left(\frac{3x^2}{x^3-3} + 2 + \coth x + \frac{x}{x^2+1}\right)$	(B) $\left(\frac{(x^3-3)(e^{2x})(\sinh x)}{\sqrt{x^2+1}}\right) \left(\frac{3x^2}{x^3-3} + 2 + \tanh x + \frac{x}{x^2+1}\right)$
(C) $\left(\frac{(x^3-3)(e^{2x})(\sinh x)}{\sqrt{x^2+1}}\right) \left(\frac{3x^2}{x^3-3} + 2 + \coth x - \frac{2x}{x^2+1}\right)$	(D) $\left(\frac{(x^3-3)(e^{2x})(\sinh x)}{\sqrt{x^2+1}}\right) \left(\frac{3x^2}{x^3-3} + 2 + \tanh x - \frac{x}{x^2+1}\right)$
(E) $\left(\frac{(x^3-3)(e^{2x})(\sinh x)}{\sqrt{x^2+1}}\right) \left(\frac{3x^2}{x^3-3} + 2 + \coth x - \frac{x}{x^2+1}\right)$	

Q18. If $x > 1$, then $\frac{d}{dx}(2^{\sec^{-1} x}) =$			
(A) $\frac{\ln 2}{2^{\sec x} \cdot x \cdot \sqrt{x^2 - 1}}$	(B) $\frac{2^{\sec^{-1} x} \ln 2}{x \sqrt{x^2 + 1}}$	(C) $\frac{2^{\sec^{-1} x} \ln 2}{x \sqrt{x^2 - 1}}$	(D) $\frac{2^{\sec^{-1} x}}{x \sqrt{x^2 - 1}}$

Q19. $\lim_{x \rightarrow 0^+} (1 + x)^{\frac{1}{x}} =$			
(A) 0	(B) 1	(C) $-e$	(D) e

Q20. $\lim_{x \rightarrow -\infty} \sec^{-1} x =$			
(A) 0	(B) $\frac{\pi}{2}$	(C) $-\infty$	(D) ∞

Q21. $\int \frac{1}{(x+1)\sqrt{x^2+2x}} dx =$ Hint: complete the square				
(A) $\tan^{-1} x + 1 + C$	(B) $\sin^{-1} x + 1 + C$	(C) $\sec^{-1} x + 1 + C$	(D) $\sec^{-1} \frac{ x+1 }{2} + C$	(E) $\sin^{-1} \frac{ x+1 }{2} + C$

السؤال رقم 22 هو تكرار للسؤال رقم 21 و يجب أن تجيب عليه للحصول على درجته

Q22. $\int \frac{1}{(x+1)\sqrt{x^2+2x}} dx =$				
(A) $\tan^{-1} x + 1 + C$	(B) $\sin^{-1} x + 1 + C$	(C) $\sec^{-1} x + 1 + C$	(D) $\sec^{-1} \frac{ x+1 }{2} + C$	(E) $\sin^{-1} \frac{ x+1 }{2} + C$

Q23.			
(A)	(B)	(C)	(D)

Q24.			
(A)	(B)	(C)	(D)

Q25.			
(A)	(B)	(C)	(D)

Q26.	
$\int \frac{x+3}{x^3+6x^2+8x} dx =$	
Hint: use Heaviside cover method.	
(A) $\frac{3}{8}\ln x + \frac{3}{4}\ln x+2 - \frac{1}{8}\ln x+4 + C$	(B) $\frac{3}{8}\ln x - \frac{3}{4}\ln x+2 + \frac{1}{8}\ln x+4 + C$
(C) $\frac{3}{8}\ln x - \frac{3}{4}\ln x+2 - \frac{1}{8}\ln x+4 + C$	(D) $\frac{3}{8}\ln x - \frac{1}{4}\ln x+2 + \frac{1}{8}\ln x+4 + C$
(E) $\frac{3}{8}\ln x - \frac{1}{4}\ln x+2 - \frac{1}{8}\ln x+4 + C$	

السؤال رقم 27 هو تكرار للسؤال رقم 26 و يجب أن تجيب عليه للحصول على درجته

Q27.	
$\int \frac{x+3}{x^3+6x^2+8x} dx =$	
(A) $\frac{3}{8}\ln x + \frac{3}{4}\ln x+2 - \frac{1}{8}\ln x+4 + C$	(B) $\frac{3}{8}\ln x - \frac{3}{4}\ln x+2 + \frac{1}{8}\ln x+4 + C$
(C) $\frac{3}{8}\ln x - \frac{3}{4}\ln x+2 - \frac{1}{8}\ln x+4 + C$	(D) $\frac{3}{8}\ln x - \frac{1}{4}\ln x+2 + \frac{1}{8}\ln x+4 + C$
(E) $\frac{3}{8}\ln x - \frac{1}{4}\ln x+2 - \frac{1}{8}\ln x+4 + C$	

Q28.	
$\int \cot^4 x dx =$	
(A) $-\frac{1}{3}\cot^3 x + \csc x + x + C$	(B) $\frac{1}{3}\csc^3 x + \cot x + x + C$
(C) $-\frac{1}{3}\cot^3 x + \cot x + x + C$	(D) $\frac{1}{3}\cot^3 x + \cot x + x + C$
(E) $-\frac{1}{3}\csc^3 x + \cot x + x + C$	

السؤال رقم 29 هو تكرار للسؤال رقم 28 و يجب أن تجيب عليه للحصول على درجته

Q29.	
$\int \cot^4 x dx =$	
(A) $-\frac{1}{3}\cot^3 x + \csc x + x + C$	(B) $\frac{1}{3}\csc^3 x + \cot x + x + C$
(C) $-\frac{1}{3}\cot^3 x + \cot x + x + C$	(D) $\frac{1}{3}\cot^3 x + \cot x + x + C$
(E) $-\frac{1}{3}\csc^3 x + \cot x + x + C$	

Q30. $\int \cos 3x \cos 5x dx =$	
(A) $\frac{\sin 2x}{4} + \frac{\sin 8x}{16} + C$	(B) $\frac{\sin 2x}{2} + \frac{\sin 8x}{8} + C$
(C) $\frac{\sin 2x}{4} - \frac{\sin 8x}{16} + C$	(D) $-\frac{\sin 2x}{4} + \frac{\sin 8x}{16} + C$
(E) $\frac{\sin 2x}{2} - \frac{\sin 8x}{8} + C$	

Q31. $\int \sqrt{25 - y^2} dy =$		
(A) $\frac{25}{2} \sin^{-1} \left(\frac{y}{5} \right) - \frac{y\sqrt{25-y^2}}{2} + C$	(B) $\frac{25}{2} \sin^{-1} \left(\frac{y}{5} \right) + \frac{y\sqrt{25-y^2}}{2} + C$	(C) $\frac{25}{4} \sinh^{-1} \left(\frac{y}{5} \right) + \frac{y\sqrt{25-y^2}}{4} + C$
(D) $\frac{25}{2} \sinh^{-1} \left(\frac{y}{5} \right) + \frac{y\sqrt{25-y^2}}{2} + C$	(E) $\frac{25}{4} \sin^{-1} \left(\frac{y}{5} \right) + \frac{y\sqrt{25-y^2}}{4} + C$	

السؤال رقم 32 هو تكرار للسؤال رقم 31 و يجب أن تجيب عليه للحصول على درجته

Q32. $\int \sqrt{25 - y^2} dy =$		
(A) $\frac{25}{2} \sin^{-1} \left(\frac{y}{5} \right) - \frac{y\sqrt{25-y^2}}{2} + C$	(B) $\frac{25}{2} \sin^{-1} \left(\frac{y}{5} \right) + \frac{y\sqrt{25-y^2}}{2} + C$	(C) $\frac{25}{4} \sinh^{-1} \left(\frac{y}{5} \right) + \frac{y\sqrt{25-y^2}}{4} + C$
(D) $\frac{25}{2} \sinh^{-1} \left(\frac{y}{5} \right) + \frac{y\sqrt{25-y^2}}{2} + C$	(E) $\frac{25}{4} \sin^{-1} \left(\frac{y}{5} \right) + \frac{y\sqrt{25-y^2}}{4} + C$	

Q33. If $y > 7$, then $\int \frac{\sqrt{y^2-49}}{y} dy =$		
(A) $\frac{\sqrt{y^2-49}}{7} - 7 \sin^{-1} \left(\frac{y}{7} \right) + C$	(B) $\frac{\sqrt{y^2-49}}{7} - 7 \sec^{-1} \left(\frac{y}{7} \right) + C$	(C) $\sqrt{y^2-49} - 7 \sec^{-1} \left(\frac{y}{7} \right) + C$
(D) $\sqrt{y^2-49} + 7 \sec^{-1} \left(\frac{y}{7} \right) + C$	(E) $\sqrt{y^2-49} - 7 \sin^{-1} \left(\frac{y}{7} \right) + C$	

السؤال رقم 34 هو تكرار للسؤال رقم 33 و يجب أن تجيب عليه للحصول على درجته

Q34. If $y > 7$, then $\int \frac{\sqrt{y^2-49}}{y} dy =$		
(A) $\frac{\sqrt{y^2-49}}{7} - 7 \sin^{-1} \left(\frac{y}{7} \right) + C$	(B) $\frac{\sqrt{y^2-49}}{7} - 7 \sec^{-1} \left(\frac{y}{7} \right) + C$	(C) $\sqrt{y^2-49} - 7 \sec^{-1} \left(\frac{y}{7} \right) + C$
(D) $\sqrt{y^2-49} + 7 \sec^{-1} \left(\frac{y}{7} \right) + C$	(E) $\sqrt{y^2-49} - 7 \sin^{-1} \left(\frac{y}{7} \right) + C$	

Q35. $\int \frac{dx}{4+4 \sin 2x} =$			
(A) $-\frac{1}{4} \tan(\frac{\pi}{4} x)+C$	(B) $-\frac{1}{8} \tan(\frac{\pi}{4}+x)+C$	(C) $-\frac{1}{8} \tan(\frac{\pi}{4}-x)+C$	(D) $-\frac{1}{8} \tan(\frac{\pi}{4}-\frac{x}{2})+C$

Q36. $\int_0^2 \frac{2}{x-1} dx =$			
(A) 0	(B) $\ln 2$	(C) 2	(D) It is a divergent improper integral

السؤال رقم 37 هو تكرار للسؤال رقم 36 و يجب أن تجيب عليه للحصول على درجته

Q37. $\int_0^2 \frac{2}{x-1} dx =$			
(A) 0	(B) $\ln 2$	(C) 2	(D) It is a divergent improper integral

Q38. The improper integral $\int_3^{\infty} \frac{5x-1}{(x-1)(x^2+1)} dx$ converges to (Hint: Use partial fractions method.)			
(A) $\frac{3\pi}{2} - \ln \frac{2}{5} - 3 \tan^{-1} 3$	(B) $\frac{3\pi}{2} + \ln \frac{2}{5} - 3 \tan^{-1} 3$	(C) $\frac{\pi}{2} - \ln \frac{2}{5} - 3 \tan^{-1} 3$	(D) $\frac{3\pi}{2} - \ln \frac{2}{5} - \tan^{-1} 3$

السؤال رقم 39 هو تكرار للسؤال رقم 38 و يجب أن تجيب عليه للحصول على درجته

Q39. The improper integral $\int_3^{\infty} \frac{5x-1}{(x-1)(x^2+1)} dx$ converges to			
(A) $\frac{3\pi}{2} - \ln \frac{2}{5} - 3 \tan^{-1} 3$	(B) $\frac{3\pi}{2} + \ln \frac{2}{5} - 3 \tan^{-1} 3$	(C) $\frac{\pi}{2} - \ln \frac{2}{5} - 3 \tan^{-1} 3$	(D) $\frac{3\pi}{2} - \ln \frac{2}{5} - \tan^{-1} 3$

السؤال رقم 40 هو تكرار للسؤال رقم 38 و يجب أن تجيب عليه للحصول على درجته

Q40. The improper integral $\int_3^{\infty} \frac{5x-1}{(x-1)(x^2+1)} dx$ converges to			
(A) $\frac{3\pi}{2} - \ln \frac{2}{5} - 3 \tan^{-1} 3$	(B) $\frac{3\pi}{2} + \ln \frac{2}{5} - 3 \tan^{-1} 3$	(C) $\frac{\pi}{2} - \ln \frac{2}{5} - 3 \tan^{-1} 3$	(D) $\frac{3\pi}{2} - \ln \frac{2}{5} - \tan^{-1} 3$