جامعة الملك عبدالعزيز.

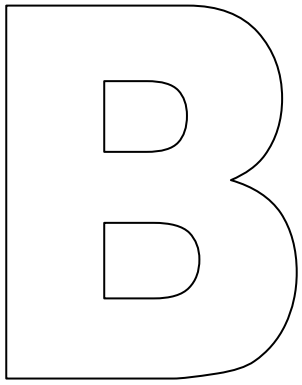
كلية العلوم. الاسم:_____

قسم الرياضيات. الرقم الجامعي:_____

Math 202.
Calculus 2.

Second Exam

Date: Saturday 19 / 1 / 1432 H.
Time: 21:00 to 22:30.



- 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.
- تأكد من تعبئة نموذج الحضور بصورة صحيحة.
- أجب عن جميع الأسئلة الآتية بتظليل الخيار الصحيح في نموذج الإجابة **بقلم الرصاص.**
- ممنوع استخدام الآلة الحاسبة.

التعريف و القانون أدناه يخص السؤال الأول

تعريف Definition: The work done by a variable force $F(x)$ directed along the x-axis from $x = a$ to $x = b$ is $W = \int_a^b F(x)dx$.

Hooke's Law for Springs: $F = kx$, where k is a constant, called spring constant.

Q1.

The work required to compress a spring from its natural length of 10 ft to a length of 6 ft, where the spring constant is $k = 12$ lb/ft, is

(A)	(B)	(C)	(D)
6 ft-lb	24 ft-lb	96 ft-lb	54 ft-lb

Q2.

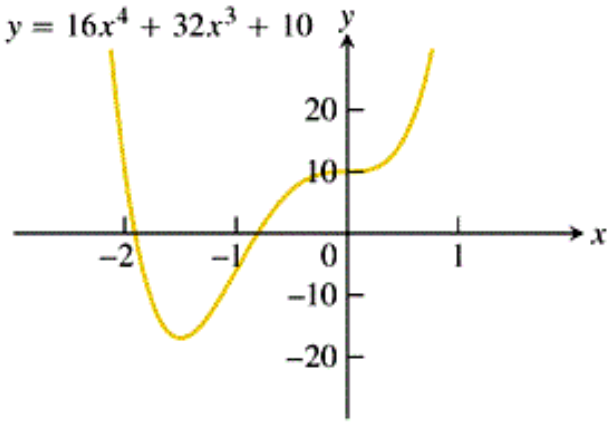
If the function $x = g(y) \geq 0$ is continuously differentiable on $[c, d]$, then the area of the surface generated by revolving the curve $x = f(y)$ about the y-axis is

$$S = \int_c^d 2\pi x \sqrt{1 + \left(\frac{dx}{dy}\right)^2}\, dy$$

(A)	(B)
TRUE	FALSE

Q3.

The function, graphed in the figure, is one-to-one on $(-\infty, \infty)$.



(A)	(B)
TRUE	FALSE

Q4.

If $f(x) = \frac{1}{x^5}$, on the domain $(-\infty, 0) \cup (0, \infty)$, then its inverse f^{-1} is

(A)	(B)	(C)	(D)
$f^{-1}(x) = x^5$	$f^{-1}(x) = \sqrt[5]{x}$	$f^{-1}(x) = \frac{1}{x^5}$	$f^{-1}(x) = \sqrt[5]{\frac{1}{x}}$

Q5.

If $1 < x$, then

(A)	(B)	(C)	(D)
$\ln x = 1$	$\ln x$ is undefined	$\ln x < 0$	$\ln x > 0$

Q6.

If $y = x^{(x+1)}$, then $\frac{dy}{dx} = y' =$

(A)	(B)
$x^{(x+1)}\,(\,1 + x + \ln x)$	$x^{(x+1)}\left(\,1 + \frac{1}{x} + \ln x\right)$
(C)	(D)
$(x+1)\,x^x$	$x^{(x+1)}\,\ln x$

Q7.

$$\int_{\frac{\pi}{4}}^{\frac{\pi}{2}} \cot x \;\; dx =$$

(A)	(B)	(C)	(D)
$-\ln\frac{1}{\sqrt{2}}$	$\ln\frac{1}{\sqrt{2}}$	$-\ln\frac{1}{2}$	$\ln\frac{1}{2}$

Q8.

The number e is defined by the positive number satisfying $\int_1^e \frac{1}{t}dt = 1$

(A)	(B)
TRUE	FALSE

Q9.

$$\lim_{x\to\infty}\left(\frac{11}{9}\right)^x =$$

(A)	(B)	(C)	(D)
Does not exist	$-\infty$	∞	0

Q10.

If $y = (\ln x)^6$, then $y' = \frac{dy}{dx} =$

(A)	(B)	(C)	(D)
$\frac{6\ln x^5}{x}$	$\frac{6(\ln x)^5}{x}$	$\frac{(\ln x)^5}{x}$	$\frac{(\ln x)^5}{6x}$

Q11.

If $y = 5^{\cos 2t}$, then $y' = \frac{dy}{dt} =$

(A)	(B)
$5^{\cos 2t}(2\sin 2t)$	$5^{\cos 2t}(\ln 5)(2\sin 2t)$
(C)	(D)
$5^{\cos 2t}(\ln 5)(-2\sin 2t)$	$5^{\cos 2t}(\ln 5)(\sin 2t)$

Q12.

$$\int_1^e \frac{2\ln 10\ \log_{10} x}{x}\, dx =$$

(A)	(B)	(C)	(D)
$\ln 10$	$-\ln 10$	1	$\frac{\ln 10}{2}$

Q13.

If $f(x) = \pi e^x$ and $g(x) = \pi 2^x$, then as $x \to \infty$

(A)	(B)	(C)
f grows faster than g	g grows faster than f	f and g grow at the same rate

Q14.

$$\lim_{x\to\infty} \cot^{-1} x =$$

(A)	(B)	(C)	(D)
0	π	$-\frac{\pi}{2}$	$\frac{\pi}{2}$

Q15.

If $\alpha = \sin^{-1}\frac{2}{3}$, then $\tan\alpha =$

(A)	(B)	(C)	(D)
$\frac{3}{\sqrt{5}}$	$\frac{\sqrt{5}}{3}$	$\frac{3}{2}$	$\frac{2}{\sqrt{5}}$

Q16.

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

(A)	(B)	(C)	(D)
$\frac{x}{\frac{x^3}{3} - x^2 + 2x} + C$	$\tan^{-1}\left(\frac{x-1}{2}\right) + C$	$\tan^{-1}(x-1) + C$	$2\tan^{-1}\left(\frac{x-1}{2}\right) + C$

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

Q17.

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

(A)	(B)	(C)	(D)
$\frac{x}{\frac{x^3}{3} - x^2 + 2x} + C$	$\tan^{-1}\left(\frac{x-1}{2}\right) + C$	$\tan^{-1}(x-1) + C$	$2\tan^{-1}\left(\frac{x-1}{2}\right) + C$

Q18. $\frac{d}{dx}(\cosh e^{2x}) =$	
(A) $-2\,e^{2x}\sinh e^{2x}$	(B) $2e^{2x}\sinh e^{2x}$
(C) $-e^{2x}\sinh e^{2x}$	(D) $e^{2x}\sinh e^{2x}$

Q19. $\int \frac{4dx}{\sqrt{7+16x^2}} =$			
(A) $\sinh^{-1}(4x)+C$	(B) $\sinh^{-1}\left(\frac{4x}{\sqrt{7}}\right)+C$	(C) $\sinh(4x)+C$	(D) $\sinh\left(\frac{4x}{\sqrt{7}}\right)+C$

السؤال رقم 20 هو تكرار للسؤال رقم 19 و يجب أن تجيب عليه للحصول على درجته

Q20. $\int \frac{4dx}{\sqrt{7+16x^2}} =$			
(A) $\sinh^{-1}(4x)+C$	(B) $\sinh^{-1}\left(\frac{4x}{\sqrt{7}}\right)+C$	(C) $\sinh(4x)+C$	(D) $\sinh\left(\frac{4x}{\sqrt{7}}\right)+C$

Q21. $\int \frac{1+\sin x}{\cos^2 x}\,dx =$ Hint: separate the fraction.	
(A) $-\tan x-\sec x+C$	(B) $\tan x-\sec x+C$
(C) $\sec x-\tan x+C$	(D) $\tan x+\sec x+C$

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

Q22. $\int \frac{1+\sin x}{\cos^2 x}\,dx =$ Hint: separate the fraction.	
(A) $-\tan x-\sec x+C$	(B) $\tan x-\sec x+C$
(C) $\sec x-\tan x+C$	(D) $\tan x+\sec x+C$

Q23. $\int \theta \cos \pi\theta \ d\theta =$	
(A) $-\frac{\theta}{\pi} \sin \pi\theta - \frac{1}{\pi^2} \cos \pi\theta + C$	(B) $\frac{\theta}{\pi} \sin \pi\theta - \frac{1}{\pi^2} \cos \pi\theta + C$
(C) $\frac{\theta}{\pi} \sin \pi\theta + \frac{1}{\pi^2} \cos \pi\theta + C$	(D) $-\frac{\theta}{\pi} \sin \pi\theta + \frac{1}{\pi^2} \cos \pi\theta + C$

السؤال رقم 24 هو تكرار للسؤال رقم 23 و يجب أن تجيب عليه للحصول على درجته

Q24. $\int \theta \cos \pi\theta \ d\theta =$	
(A) $-\frac{\theta}{\pi} \sin \pi\theta - \frac{1}{\pi^2} \cos \pi\theta + C$	(B) $\frac{\theta}{\pi} \sin \pi\theta - \frac{1}{\pi^2} \cos \pi\theta + C$
(C) $\frac{\theta}{\pi} \sin \pi\theta + \frac{1}{\pi^2} \cos \pi\theta + C$	(D) $-\frac{\theta}{\pi} \sin \pi\theta + \frac{1}{\pi^2} \cos \pi\theta + C$

Q25. $\int (1 - \coth^2 x) \ dx =$			
(A) $\coth x + C$	(B) $-\coth x + C$	(C) $\tanh x + C$	(D) $-\tanh x + C$

Answers to Exam 2

19/1/1432

Answers to B

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
C	A	B	D	D	B	A	A	C	B	C	C	A	A	D	C	C	B	B	B	D	D	C	C	A