جامعة الملك عبدالعزيز.

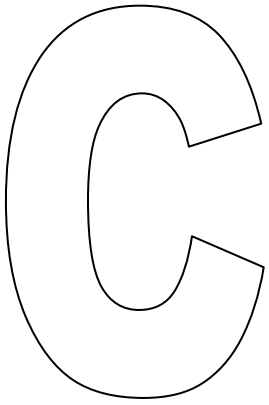
كلية العلوم. الاسم:_____

قسم الرياضيات. الرقم الجامعي:_____

math 202.
Calculus 2.

First Exam

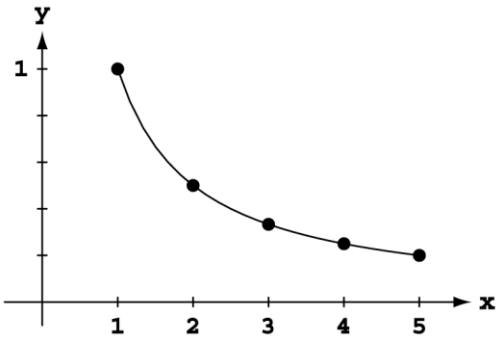
Date: Saturday 22 / 11 / 1431.
Time: from 21:00 to 22:30.



- 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 **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.

Q1.

The upper sum with four rectangles of equal width of $f(x) = \frac{1}{x}$ between $x = 1$ and $x = 5$ is



(A)	(B)	(C)	(D)
$\frac{1}{2}+\frac{1}{3}+\frac{1}{4}+\frac{1}{5}$	$1+\frac{1}{2}+\frac{1}{3}+\frac{1}{4}$	$1+\frac{1}{2}+\frac{1}{3}+\frac{1}{4}+\frac{1}{5}$	$\frac{1}{2}+\frac{1}{3}+\frac{1}{4}+\frac{1}{5}+\frac{1}{6}$

Q2.

Suppose that $\sum_{k=1}^{n} a_k = 3$ and $\sum_{k=1}^{n} b_k = -5$. Then $\sum_{k=1}^{n}(b_k + 2a_k) =$

(A)	(B)	(C)	(D)
-11	11	1	-1

Q3.

$\sum_{k=1}^{8} k^2 =$

(A)	(B)	(C)	(D)
$\frac{9\,(10)\,(19)}{6}$	$\frac{8\,(9)\,(17)}{6}$	$\frac{7\,(8)\,(15)}{6}$	$\frac{6\,(7)\,(13)}{6}$

Q4.

If $1 \le f(x) \le 5$ for each $x \in [\,1\,,3\,]$ and f is continuous on $[\,1\,,3\,]$, then

(A)	(B)	(C)	(D)
$2 \le \int_1^3 f(x)dx \le 10$	$\int_1^3 f(x)dx \le -10$	$-1 \le \int_1^3 f(x)dx \le 1$	$0 \le \int_1^3 f(x)dx \le 1$

Q5.

If f is an even function and $\int_{-2}^{2} f(x)dx = 8$, then $\int_0^2 \frac{f(x)}{2}\,dx =$

(A)	(B)	(C)	(D)
2	1	$\frac{1}{2}$	$\frac{1}{4}$

Q6.

If $g(x) = \int_0^x 3t^2 dt$ for each $x \in [\,1\,,9\,]$, then $g'(3) =$

(A)	(B)	(C)	(D)
12	3	27	9

Q7. If $h'(x) = k(x)$, for each x , then $\int k(x)dx = h'(x) + C$, where C is constant.	
(A) TRUE	(B) FALSE

Q8. $\frac{d}{dx}\left(\int_2^{x^2} \sin t \ dt\right) =$			
(A) $2t \sin t$	(B) $2x \sin x^2$	(C) $-2x \cos x^2$	(D) $2t \cos t^2$

Q9. If h is integrable on $(-\infty, \infty)$, then the answer of $\int h(x)dx$ is a function	
(A) TRUE	(B) FALSE

Q10. $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} x^5 \cos^2 x \ dx =$			
(A) 0	(B) -2π	(C) 2π	(D) $-\frac{2\pi}{3}$

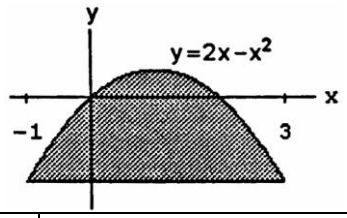
Q11. $\int x \sin(x^2)\, dx =$			
(A) $\frac{1}{2}\sin(x^2) + C$	(B) $-\frac{1}{2}\sin(x^2) + C$	(C) $-\frac{1}{2}\cos(x^2) + C$	(D) $\frac{1}{2}\cos(x^2) + C$

Q12. The indefinite integral $\int \csc^2 x \cot x \ dx$ has two different correct answers. They can be obtained by substitution			
(A) $u = \csc x \cot x$ and $u = \cot x$	(B) $u = x$ and $u = \cot x$	(C) $u = \csc^2 x$ and $u = \cot x$	(D) $u = \csc x$ and $u = \cot x$

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

Q13. The indefinite integral $\int \csc^2 x \cot x \ dx$ has two different correct answers. They can be obtained by substitution			
(A) $u = \csc x \cot x$ and $u = \cot x$	(B) $u = x$ and $u = \cot x$	(C) $u = \csc^2 x$ and $u = \cot x$	(D) $u = \csc x$ and $u = \cot x$

Q14. The area of the region between the curves of $f(x) = 2x - x^2$ and $g(x) = -3$ is



(A)	(B)	(C)	(D)
$\frac{32}{3}$	$\frac{31}{3}$	$\frac{29}{3}$	$\frac{25}{3}$

السؤال رقم 15 هو تكرار للسؤال رقم 14 و يجب أن تجيب عليه للحصول على درجته

Q15. The area of the region between the curves of $f(x) = 2x - x^2$ and $g(x) = -3$ is

(A)	(B)	(C)	(D)
$\frac{32}{3}$	$\frac{31}{3}$	$\frac{29}{3}$	$\frac{25}{3}$

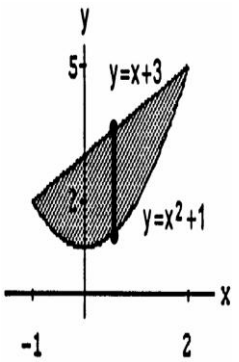
Q16. $\int 3y\ \sqrt{7-3y^2}\ dy =$

(A)	(B)	(C)	(D)
$\frac{1}{3}\ (7-3y^2)^{\frac{3}{2}} + C$	$-\frac{1}{3}\ (7-3y^2)^{\frac{3}{2}} + C$	$\frac{2}{3}\ (7-3y^2)^{\frac{3}{2}} + C$	$-\frac{2}{3}\ (7-3y^2)^{\frac{3}{2}} + C$

Q17. If f is continuous on $[a, b]$ and $f(x) < 0$ for all $x \in [a, b]$, then $\int_a^b f(x)dx$ means the area of the region bounded by the curve of f and the x-axis between the vertical lines $x = a$ and $x = b$.

(A)	(B)
TRUE	FALSE

Q18. The volume of the solid generated by revolving the region bounded by curve $y = x^2 + 1$ and the line $y = x + 3$ about the x-axis is



(A)	(B)	(C)	(D)
$\frac{109\pi}{5}$	$\frac{113\pi}{5}$	$\frac{117\pi}{5}$	$\frac{121\pi}{5}$

السؤال رقم 19 هو تكرار للسؤال رقم 18 و يجب أن تجيب عليه للحصول على درجته

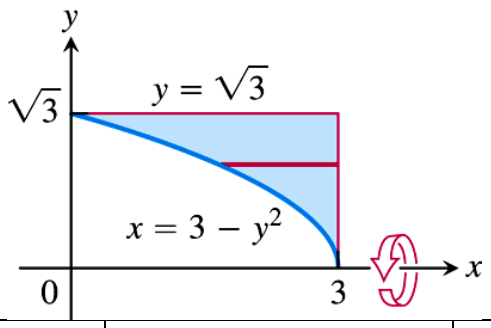
Q19.

The volume of the solid generated by revolving the region bounded by curve $y = x^2 + 1$ and the line $y = x + 3$ about the x-axis is

(A)	(B)	(C)	(D)
$\frac{109\pi}{5}$	$\frac{113\pi}{5}$	$\frac{117\pi}{5}$	$\frac{121\pi}{5}$

Q20.

By using the shell method, the volume of the solid generated by revolving the shaded region bounded by the lines $y = \sqrt{3}$, $x = 3$ and the curve $x = 3 - y^2$ about the x-axis is



(A)	(B)	(C)	(D)
$\frac{7\pi}{2}$	$\frac{5\pi}{2}$	$\frac{3\pi}{2}$	$\frac{9\pi}{2}$

السؤال رقم 21 هو تكرار للسؤال رقم 20 و يجب أن تجيب عليه للحصول على درجته

21.

The volume of the solid generated by revolving the shaded region bounded by the lines $y = \sqrt{3}$, $x = 3$ and the curve $x = 3 - y^2$ about the x-axis is

(A)	(B)	(C)	(D)
$\frac{7\pi}{2}$	$\frac{5\pi}{2}$	$\frac{3\pi}{2}$	$\frac{9\pi}{2}$

Q22.

The integral for the length of the curve $y = x^3$, $-1 \le x \le 2$ is

(A)	(B)	(C)	(D)
$\int_{-1}^{2} \sqrt{1 + 9x^4}\ dx$	$\int_{-1}^{2} \sqrt{1 + x^4}\ dx$	$\int_{-1}^{2} 3\sqrt{1 + x^4}\ dx$	$\int_{-1}^{2} \sqrt{1 - 9x^4}\ dx$

Use the following formulas to solve Questions 23, 24, and 25. Note that the density function is $\delta(x)$	استخدم القوانين التالية لحل الأسئلة 23 و 24 و 25 : الدالة التي تعطي الكثافة هي $\delta(x)$

Moment about the origin along the x-axis: $M_0 = \int_a^b x\delta(x)dx$

Mass along the x-axis: $M = \int_a^b \delta(x)dx$

Center of mass along the x-axis: $\bar{x} = \frac{M_0}{M}$

Q23.

If the density of a thin rod is given by $\delta(x) = 2 - \frac{x}{4}$, where the rod is lying along the interval $[0\ ,\ 4]$ of the x-axis, then the moment M_0 about the origin is

(A)	(B)	(C)	(D)
$\frac{31}{3}$	$\frac{31}{2}$	$\frac{32}{3}$	$\frac{32}{2}$

Q24.

If the density of a thin rod is given by $\delta(x) = 2 - \frac{x}{4}$, where the rod is lying along the interval $[0\ ,\ 4]$ of the x-axis, then the mass M is

(A)	(B)	(C)	(D)
8	7	6	5

Q25.

If the density of a thin rod is given by $\delta(x) = 2 - \frac{x}{4}$, where the rod is lying along the interval $[0\ ,\ 4]$ of the x-axis, then the center of mass $\bar{x}$ is

(A)	(B)	(C)	(D)
$\frac{31}{24}$	$\frac{31}{14}$	$\frac{16}{9}$	$\frac{16}{5}$