جامعة الملك عبدالعزيز.

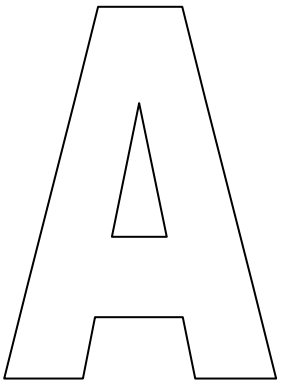
كلية العلوم. الاسم:_____

قسم الرياضيات. الرقم الجامعي:_____

math 202.
Calculus 2.

First Exam

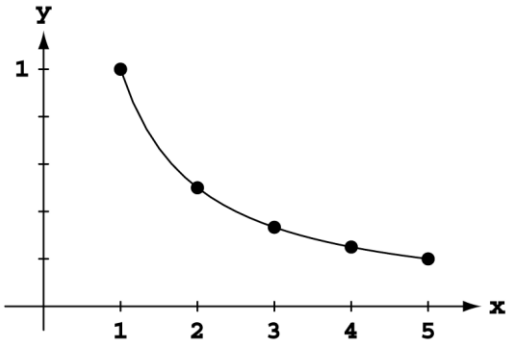
Date: Saturday 22 / 11 / 1431.
Time: from 21:00 to 22:30.



- تأكد من أن رمز نموذج الإجابة لديك هو A .
- 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 lower sum with four rectangles of equal width of $f(x) = \frac{1}{x}$ between $x = 1$ and $x = 5$ is



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

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.

$\sum_{k=1}^{6} k^2 =$

(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 $1 \le f(x) \le 6$ for each $x \in [\,1\,,3\,]$ and f is continuous on $[\,1\,,3\,]$, then

(A)	(B)	(C)	(D)
$-1 \le \int_1^3 f(x)dx \le 1$	$0 \le \int_1^3 f(x)dx \le 1$	$\int_1^3 f(x)dx \le -12$	$2 \le \int_1^3 f(x)dx \le 12$

Q5.

If f is an even function and $\int_{-2}^{2} f(x)dx = 8$, then $\int_0^2 \frac{f(x)}{4}\,dx =$

(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 $g'(2) =$

(A)	(B)	(C)	(D)
8	4	16	12

Q7.

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

(A)	(B)
TRUE	FALSE

Q8.

$\frac{d}{dx}\left(\int_2^{x^2} \cos t \ \ dt\right) =$

(A)	(B)	(C)	(D)
$2t \ \sin t$	$-2x \ \sin x^2$	$2x \ \cos x^2$	$2t \cos t^2$

Q9.

If f is integrable on $(-\infty, \infty)$, then the answer of $\int f(x)dx$ is a function

(A)	(B)
TRUE	FALSE

Q10.

$\int_{-\frac{\pi}{3}}^{\frac{\pi}{3}} x^9 \cos x \ \ dx =$

(A)	(B)	(C)	(D)
$-\frac{2\pi}{3}$	$\frac{3\pi}{2}$	$\frac{2\pi}{3}$	0

Q11.

$\int x^2 \ \sin(x^3)\, dx =$

(A)	(B)	(C)	(D)
$-\frac{1}{3}\cos(x^3) + C$	$\frac{1}{3}\cos(x^3) + C$	$-\frac{1}{3}\sin(x^3) + C$	$\frac{1}{3}\sin(x^3) + C$

Q12.

The indefinite integral $\int \cot x \ \csc^2 x \ dx$ has two different correct answers. They can be obtained by substitution

(A)	(B)	(C)	(D)
$u = \cot x$ and $u = \csc^2 x$	$u = \cot x$ and $u = \csc x$	$u = \cot x$ and $u = \csc x \cot x$	$u = \cot x$ and $u = x$

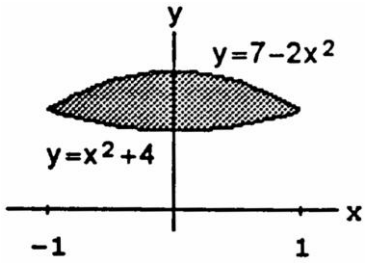
السؤال رقم 13 هو تكرار للسؤال رقم 12 و يجب أن تجيب عليه للحصول على درجته

Q13.

The indefinite integral $\int \cot x \ \csc^2 x \ dx$ has two different correct answers. They can be obtained by substitution

(A)	(B)	(C)	(D)
$u = \cot x$ and $u = \csc^2 x$	$u = \cot x$ and $u = \csc x$	$u = \cot x$ and $u = \csc x \cot x$	$u = \cot x$ and $u = x$

Q14. The area of the region between the curves of $f(x) = 7 - 2x^2$ and $g(x) = x^2 + 4$ is



(A)	(B)	(C)	(D)
9	-12	4	12

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 $f(x) = 7 - 2x^2$ and $g(x) = x^2 + 4$ is

(A)	(B)	(C)	(D)
9	-12	4	12

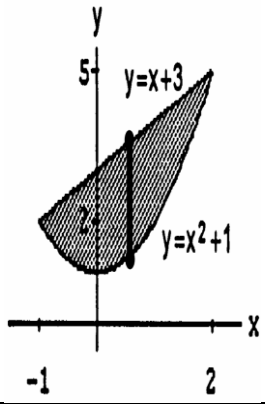
Q16. $\int 8\theta \sqrt[3]{\theta^2 - 1}\ d\theta =$

(A)	(B)	(C)	(D)
$3(\theta^2 - 1)^{\frac{2}{3}} + C$	$3(\theta^2 - 1)^{\frac{1}{3}} + C$	$3(\theta^2 - 1)^{\frac{3}{4}} + C$	$3(\theta^2 - 1)^{\frac{4}{3}} + C$

Q17. If f is non-negative and continuous on $[a, b]$, 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)
$\frac{119\pi}{5}$	$\frac{117\pi}{5}$	$\frac{113\pi}{5}$	$\frac{111\pi}{5}$

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

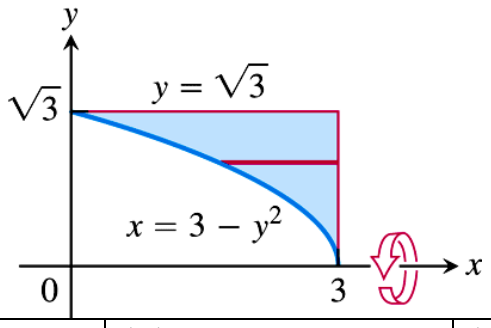
Q19.

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)
$\frac{119\pi}{5}$	$\frac{117\pi}{5}$	$\frac{113\pi}{5}$	$\frac{111\pi}{5}$

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)
$\frac{9\pi}{2}$	$\frac{7\pi}{2}$	$\frac{5\pi}{2}$	$\frac{3\pi}{2}$

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

Q21.

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)
$\frac{9\pi}{2}$	$\frac{7\pi}{2}$	$\frac{5\pi}{2}$	$\frac{3\pi}{2}$

Q22.

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

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

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)
$\frac{31}{3}$	$\frac{32}{3}$	$\frac{31}{2}$	$\frac{32}{2}$

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)
5	6	7	8

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)
$\frac{31}{15}$	$\frac{16}{9}$	$\frac{31}{14}$	2