بسم الله الرحمن الرحيم

الجامعة الأردنية تفاضل وتكامل الأحد: 99/6/6

قسم الرياضيات الامتحان النهائي ساعتان

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note: the finel Exam consists of two part; part 16 NCQ, choose and circle the best and right answer pasts $\prod$, 4 problems, solve.

Part I: 32 paints

1- one of the polar coordinates of the point $P(x,y)=(-\sqrt{3},1)is:$

$\left(2,\frac{5\prod}{6}\right)$ b) $\left(2,-\frac{-\prod}{6}\right)$

$\left(-2,\frac{\prod}{6}\right)$ d) $\left(-2,\frac{-5\prod}{6}\right)$

By trans forming from rectangular to polar coordinates, the equation x^2+y^2 - 6y= 0 becomes:

a) r= 3 sin θ b) r= 3 cos θ

c) r= 6 sin θ d) r-6 cos θ

3- Poy trans forming from polar to rectangutlar coordinates, the equation r^2 cos 2 θ -9 besomes;

a) xy-9 b) x^2 -y^2=9

c) x+y=9 d) y^2-x^2=9

4- the length of the curve $y=\sqrt{1-x^2},-1\leq\times\leq is$

a)$\prod$ b)$\frac{\prod}{2}$ c) 2 $\prod$ d) $\frac{\prod}{4}$

5) the volume of the solid generated by rotating the region under the curve y= e^{-x^2} over $1 \leq \times < \infty$ around the y- axis is:

a) $\prod$ b) $\frac{\prod}{e}$ c) $\frac{1}{e}$ d) $\frac{e}{\prod}$

6) $\int_1^4 \frac{\ln x}{\sqrt{x}} dx =$

a) 2 ln 2 b) 4 ln 2-8

c) 8 ln 2-4 d) 2ln -4

7(the eccentricity e of the ellipse 25 x^2 + 9y^2= 225 is

a) $\frac{4}{5}$ b) $\frac{3}{5}$ c) $\frac{5}{4}$ d) $\frac{5}{3}$

8) the equation of the ellipse whose eccentricity $e\frac{2}{3}$, focus at (0.0), and the corresponding directrix is x-2 is:

a) x^2 + 3y^2+ 8x-8-8=0 b) 3x^2y^2+8y-8=0

c) 5x^2+8y^2+16x-16=0 d) 9x^2+5y^2+16y-16=0

9) the equation of the hyperbola whose asymptotes are: $y = \mp\frac{12}{5}\times$ and vertices $(0,\mp 24)$ one:

$\frac{x^2}{25} - \frac{y^2}{144} = 1$ b) $\frac{y^2}{144} - \frac{x^2}{25} = 1$

c) $\frac{x^2}{100} - \frac{y^2}{576} = 1$ d) $\frac{y^2}{576} - \frac{x^2}{100} = 1$

10) Let $x'y'$ be the coordinate axes abtained by rotoing the xy-axes to eliminate the xy term.

If the coordinated of the focus of the parabola

$x^2 + 2\sqrt{3}\times y + 3y^2 + 2\sqrt{3}\times -2y = 0$

In the $x'y'$ ciardinate syslem are $\left(0,\frac{1}{4}\right)$, them the coordinates of the focus in the xy system are:

$\left(-\frac{\sqrt{3}}{8},\frac{1}{8}\right)$ b) $\left(-\frac{1}{8},\frac{\sqrt{3}}{8}\right)$

$\left(\frac{1}{8},\frac{\sqrt{3}}{8}\right)$ d) $\left(\frac{\sqrt{3}}{8},-\frac{1}{8}\right)$

11) lim $\underset{n\to\infty}{Lim}\left(\frac{n+3}{n+1}\right)^{n+2}$

a) e^2 b)e^{-2} c) $e^{\frac{1}{2}}$ d) $e^{-\frac{1}{2}}$

12) the series

$\frac{1}{2}-\frac{1}{4}-\frac{1}{8}+\frac{1}{16}+\frac{1}{32}-\frac{1}{64}-\frac{1}{128}+.....is$

a) conditionally convergent b) absolutely convergent

c) Neither absolutely nor conditionally convergent.

d) divergent

13) the series $\sum_{k=1}^{\infty}\frac{1}{1+\left(\frac{1}{2}\right)^k}:is$

a) convergent by comparison with $\sum_{k=1}^{\infty}\left(\frac{1}{2}\right)^k$

b) convergent because it is gemetric and $r=\frac{1}{2}$

c) Divergent by the integeal test.

d) Divergent by the divergeace teat.

14) the sin of the series $\sum_{n=0}^{\infty}\left(\frac{3}{2^n}-\frac{2}{3^n}\right)$ is:

a) -2< x< 2 b) $-2\le\times\le 2$

c) -1< x < 1 d) $-1\le\times\le 1$

16) the Taylor series of senx at $-1\le\times\le 1$

a) $\sum_{n=0}^{\infty}(-1)^n\frac{\left(x-\prod\right)^{2n+1}}{(2n+1)!}\ \forall x.$

b) $\sum_{n=0}^{\infty}(-1)^n\frac{\left(x-\frac{\prod}{2}\right)^{2n}}{(2n)!}\ \forall x.$

c) $\sum_{n=0}^{\infty}\frac{\left(x-\frac{\prod}{2}\right)^{2n+1}}{(2n+1)!}\ \forall x.$

d) $\sum_{n=0}^{\infty} \frac{\left(x-\frac{\prod}{2}\right)^{2n}}{(2n)!} \forall x.$

End of Part I

Go to Part II

بسم الرحمن الرحيم

الجامعة الأردنية الامتحان النهائي الخميس 98/8/13

قسم الرياضيات Math 102

اسم الطالب:

رقم الطالب الجامعي:

Q_1: the parametric equations of the circle $(x+1)^2 + y(y-2)=1$ in cluckuise direction are:

a) X=1- cost	, y=2-sint	$O \le t \le 2\prod$
b) X= -1+sint	,y=2+rost	$O \le t \le 2\prod$
c) x=1+sint	,y=2- rost	$O \le t \le 2\prod$
d) x=-1rost	,y=2+sint	$O \le t \le 2\prod$

Q_2 the equation of the tangent line to the curue C:

$$x = -\sqrt{2}\cos t \qquad \le t \le 2\prod$$
$$y = 2\sqrt{2}\sin t$$

At (1,2) is

a) y-x=1 b) y+2x=4

c) y+x=3 d) 2y+x=5

Q_3: the equation for the conic seetion with vertices (1.0), (-5, $\prod$) and the pole at a focus is

$r = \frac{5}{2-5\cos\theta}$ b) $r = \frac{5}{2-5\sin\theta}$

$r = \frac{5}{2+3\sin\theta}$ d) $r = \frac{5}{2+3coin\theta}$

Q_4: $\sum_{n=1}^{\infty}(-1)^n \frac{(\ln 3)^n}{in} is$

a) $\ln_3$ b)2 c) $-\frac{2}{3}$ e) 3

Q_5: the radw of cenvergence of $\sum_{n=1}^{\infty} n! \ \frac{(3x)^n}{n^n}$ is

a) $\frac{e}{3}$ b) 3 ero c) $\frac{e}{2}$ d) ∞

Q_6: of the area of the regson enelsed by the rose curve r= sin (88) is A, then then the area enclosed by r= 3 sin (88) is

a) 3A b) $\frac{A}{3}$ c) qA d) A^3

Q_7: $\int_2^3 x^3\left(4-x^2\right)^3 dx =$

$-\frac{3}{5}$ b) + $\frac{3}{5}$

$\frac{25}{2}\left(\frac{1}{\sqrt{5}}-1\right)$ d) $\frac{25}{2}\left(\frac{1}{\sqrt{5}}+1\right)$

Q_8: the graph of r^{-1}=3+3 cos θ is

a) Hyperbola with e=3 b) cardiod

c) parabola d) circle

Q_9 : the polar equation r^2= is symmeric abeut

a) only the (pole) b) the y-axis (only

c) All the axes and pole d) the x-axis only

Q_{10} : the polar equation of the cure $\left(x^2+y^2\right)^3 = L_1 x^2 y^2$

$r^3 = \sin 2\theta$ b) $r^2 = 4\sin^2 2\theta$

$r = \sin 2\theta$ d) $r^2 = 2con2\theta$

Q_{11}: what is the length from x=0 to $\frac{\Pi}{2}$ of the curve whose slope in this interval is $\frac{dy}{dx} = \sqrt{\cos x}$

a) $2\sqrt{2}$ b) 1 c) 2 Π d)2

Q_{12}: the area inslde the cardivd r= 1- cosθ and outslde the circle r=1 is

a) $4-\frac{\prod}{2}$ b) $4+\frac{\prod}{2}$ c) $1+\frac{\prod}{8}$ d) $2+\frac{\prod}{4}$

Q_{13}: the base of a solid S is rectangle bounded bounded by X=0. X=8, y=3, y=-3 and of

Every cross seetion perpendicular to the x-a xis is a semicirele with its diameter in the xy - planes, then the Volume of S is

a) 36 $\prod$ b) 27 $\prod$ c) 72 $\prod$ d)54 $\prod$

Q_{14}: $\underset{n\to\infty}{Lim}$ If an =0 0n>0

Then $\frac{S^{\infty}}{n=1}\frac{(-1)^n.Qn}{n^3}$ *is*

a) diverges b) Absolutely con U

b) conditionally con U. d) we can't decide.

Q_{15}: consider the region R in the fiyure, then the velume of the soild generated by revolving R about the line x=4, Using the shell method is give by:

a) $2\prod\int_{0}^{4}\left(2-\sqrt{x}\right)x.dx$

b) $2\prod\int_{0}^{2}(2-x)\left(4-x^2\right)dx$

c) $2\prod\int_{0}^{2}\left(4-x^2\right)dx$

d) $2\prod\int_{0}^{4}(4-x)\left(2-\sqrt{x}\right)dx$

Q_{16}: $\int_{1}^{4}\sqrt{x}.\ln v.dx=$

$\frac{32\ln 2}{3}-\frac{28}{9}$ b) $\frac{16\ln 2}{2}-\frac{4}{9}$

$\frac{16\ln 2}{3}-\frac{4}{3}$ d) $\frac{32\ln 2}{3}-4$

Q17: $\int_0^{\frac{\pi}{4}} \cos\theta \sin\theta \, d\theta =$

$\frac{2\sqrt{21}}{3\sqrt{2}}$ b) $\frac{8-3\sqrt{3}}{12}$

$\frac{-2}{3}$ d) 1

Q18: $\sum_{n=1}^{\infty} (-1)^{2n}+(-1)^{2+1} is$

a) -1 b) 1 c) 0 d) diverges.

Q19: $\int_{-1}^{0} x.\sqrt{x+1}\, dx$

a) $\frac{2}{3}$ b) $-\frac{1}{3}$ c) $-\frac{4}{15}$ d) 0

Q20: $\int_{\frac{\pi}{3}}^{\frac{\pi}{4}} \frac{dx}{1-\sin x} =$

a) س3−س2−1 b) 1−س2+س3

c) 3−س2+س3 d) س3+س2−1

Q21; $\frac{A}{x-1}+\frac{B}{(x-1)^2}+\frac{CX+D}{x^2+x+1}$ is a possible partsal fractsor of:

$\frac{x+3}{(x-1)^2.(x^3+1)}$ b) $\frac{x+3}{(x-1)^2.(x^3+1)}$

$\frac{5x+3}{(x-1)^3(x^3-1)}$ d) mon

of the above

Q22: let r=2-2 sin θ, then $\frac{dx}{d\theta}$ =0 when θ

$\left\{\frac{\pi}{2},\frac{\pi}{6},\frac{5\pi}{6}\right\}$ $\left\{\frac{\pi}{2},\frac{-\pi}{6},\frac{-5\pi}{6}\right\}$

b

)

$\left\{\frac{-\prod}{2}, \frac{\prod}{6}, \frac{5\prod}{6}\right\}$

d $\left\{\frac{\prod}{2}, \frac{-\prod}{6}, \frac{-5\prod}{6}\right\}$

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