# Đề 1

## I . trắc nghiệm:

**câu 1**. $\lim\limits_{x\to 0+} x^{\frac{3(lnx)^2}{4+lnx}} = e^{\lim\limits_{x\to 0+}\frac{3(lnx)^3}{4+lnx}} = e^{\lim\limits_{x\to 0+}\frac{9(lnx)^2}{1}} =$

$e^{\infty}=+\infty$

vì $\lim\limits_{x\to 0+}$ lnx=-∞

**câu 2** . $\lim\limits_{x\to 0}\frac{\ln(1-(sin2x)^3)}{4x^3}=\lim\limits_{x\to 0}\frac{-(sin2x)^3}{4x^3}=\frac{-2^3}{4}=-2$

**câu 3**. $\lim\limits_{x\to\infty}\left(\frac{2x-4}{2x-5}\right)^{1-3x} = e^{\lim\limits_{x\to\infty}\left(\frac{2x-4}{2x-5}-1\right)(1-3x)} =$

$e^{\lim\limits_{x\to\infty}\left(\frac{(1-3x)}{2x-5}\right)}$=e^(-3/2)

**câu 4** y=arcsin($\frac{x-3}{2}$) $-\log(4-x)$ TXD

$\begin{cases}-1\le\frac{x-3}{2}\le 1\\ 4-x>0\end{cases}\begin{cases}1\le x\le 5\\ x<4\end{cases}$=>1≤ $x<4$

**câu 5**

$\lim\limits_{x\to 0} f(x) =$

$\lim\limits_{x\to 0}\frac{2cosx-2\sqrt{cos2x}}{(tanx)^2}=\lim\limits_{x\to 0}\frac{2-2(1-cosx)-2\sqrt{1-(1-cos2x)}}{(tanx)^2} =$

$\lim\limits_{x\to 0}\frac{2-x^2-2\sqrt{1-2x^2}}{x^2}=\lim\limits_{x\to 0}\frac{-2x-\frac{-4x}{2\sqrt{1-2x^2}}}{2x}$=-1+2=1

**câu 6** y=$\frac{1}{2x^2-5x+2}=\frac{1}{(x-2)(2x-1)}=\frac{A}{x-2}-\frac{B}{2x-1}=\frac{1}{x-2}-\frac{2}{2x-1}$

dùng đồng nhất hệ số ta có : $\begin{cases} 2A-B=0 \\ -A+2B=1 \end{cases} => \begin{cases} A=1 \\ B=2 \end{cases}$

$y^{(8)}=\frac{8!}{(x-2)^9}-\frac{8!2^9}{(2x-1)^9}$ tự qui đồng .

***câu 7*** $y=x^{\frac{1}{x}}$ ⇔ lny=(1/x)lnx

$\frac{y'}{y}=(-\frac{1}{x^2}lnx+\frac{1}{x^2}$=>y'=(1-lnx) $x^{\frac{1}{x}-2}$

***câu 8***

$y=\frac{1-x}{e^{-x}}$=1/e -x$e^{-x}$

$y^{(10)}=-C_{10}^{0}xe^{-x}-C_{10}^{1}-e^{-x}$ thay x=2 vào=> $y^{(10)}=\frac{9}{e^2}$

***câu 9***

$$\int \frac{-4cos^3xsinx}{1+cos^4x}dx$$

đặt $t=1+cos^4x$ ta có t>0

$dt=-4cos^3xsinxdx$ =>$\int \frac{1}{t}dt$ =ln(t)+c=ln$(1+cos^4x)$ +c

***câu 10*** diện tích bởi $y=\frac{lnx}{x^2}$ $và\ x=e\ và\ trục\ hoành\ y=0$

phương trình hoành độ giao điểm $\frac{lnx}{x^2}$=0=>x=1

$\int_1^e \frac{lnx}{x^2}dx$=1-2/e

***câu 11*** tìm tích phân suy rộng Hội tụ :

$\int_0^{+\infty} x^2 dx = \lim_{b\to\infty} \int_0^b x^2 dx = \lim_{b\to\infty} \frac{1}{3}(b^3 - 0^3) = +\infty$ PK

$\int_{-\infty}^0 e^x dx = \lim_{b\to-\infty} \int_{-\infty}^0 e^x dx = \lim_{b\to\infty}(e^b - e^0) = +\infty$ PK

$\int_1^{+\infty} \frac{1}{x ln^3 x} dx = \int_1^{+\infty} \frac{1}{ln^3 x} d(lnx) = \lim_{b\to\infty} \int_1^b \frac{1}{ln^3 x} d(lnx) =$

$\lim_{b\to\infty}(\frac{-1}{4}\frac{1}{ln^4 b}$+1/4*1/0) tới đây tạm bí làm câu D.

$\int_e^{+\infty} \frac{ln^3 x}{x} dx = \int_e^{+\infty} ln^3 x d(lnx) = \lim_{b\to\infty} \int_e^{+\infty} ln^3 x d(lnx) =$

$\lim_{b\to\infty} 1/4(ln^4 b - 1) = +\infty$ PK

=> câu C hội tụ .

***câu12***

$\sum_{n=2}^{\infty} 2.3^{-n}[1.5^n - (-2)^n] = \sum_{n=2}^{\infty} 2.(\frac{1}{2})^n - 8(-\frac{2}{3})^n$

vì n=2

=>S=$2\frac{(\frac{1}{2})^2}{1-1/2} - 8\frac{(-\frac{2}{3})^2}{1+2/3}$=-17/15

***câu 13***

$\sum_{n=1}^{\infty} \frac{(\sqrt{n+1})^2}{n^2+1}$ xét $\lim_{n\to\infty} U_n = \lim_{n\to\infty} \frac{(\sqrt{n+1})^2}{n^2+1} = \lim_{n\to\infty} 1/n$ dãy này PK

$\sum_{n=1}^{\infty} nsin(\frac{1}{n})$ xét $\lim_{n\to\infty} U_n = \lim_{n\to\infty} nsin(\frac{1}{n})$=n(1/n)=1 PK

$\sum_{n=1}^{\infty} \frac{\sqrt[n]{e}+1}{n^2+1}$ xét $\lim_{n\to\infty} U_n = \lim_{n\to\infty} \frac{e^{1/n}+1}{n^2+1} = \lim_{n\to\infty} \frac{1/n}{n^2+1} = \lim_{n\to\infty} (\frac{1}{n^3})$ =0

HT vì 3>1

***câu 14***

$\sum_{n=1}^{\infty}(-\frac{1}{3})^n$Dùng $\lim_{n\to\infty}\sqrt[n]{Un}=\lim_{n\to\infty}\sqrt[n]{(-\frac{1}{3})^n}$

=-1/3 <1 HT

$\sum_{n=1}^{\infty}(\frac{n}{2n+1})^n$Dùng $\lim_{n\to\infty}\sqrt[n]{Un}=\lim_{n\to\infty}\sqrt[n]{(\frac{n}{2n+1})^n}$=1/2<1 HT

$$\sum_{n=1}^{\infty}\sqrt{n}-\sqrt{n-1}$$

ta có

$\sqrt{n}-\sqrt{n-1}$>0 dãy số luôn tăng với mọi n

=>$\lim_{n\to\infty}U_n$>0$\forall n>1$ => dãy PK chọn D

***câu 15*** bán kính hội tụ :

$\sum_{n=3}^{\infty}(\frac{n}{n-2})^{n^2}$ bán kính hội tụ là :$\rho=\lim_{n\to\infty}\sqrt[n]{(\frac{n}{n-2})^{n^2}}=$

$\lim_{n\to\infty}(\frac{n}{n-2})^n=e^{\lim_{n\to\infty}\left(\frac{n}{n-2}-1\right)n}$

$=e^{\lim_{n\to\infty}\left(\frac{2n}{n-2}\right)}=e^2$

R=1/ $\rho=e^{-2}$

Đề 2

trắc nghiệm

Câu 1

$\lim_{x\to 0}\frac{1-\sqrt{cos2x}}{(sinx)^2}=\lim_{x\to 0}\frac{1-\sqrt{1-(1-cos2x)}}{(sinx)^2}=\lim_{x\to 0}\frac{1-\sqrt{1-(2x^2)}}{(2x)^2}$

$=\lim_{x\to 0}\frac{-\frac{4x}{\sqrt{1-(2x^2)}}}{4x}$=-1

câu 2

$$\lim_{x\to 0}\frac{\ln(cosx)}{(x)^2}=\lim_{x\to 0}\frac{\ln(1+(-(1-cosx)}{(x)^2}$$

$$=\lim_{x\to 0}\frac{(-(x^2/2)}{(x)^2}=-\frac{1}{2}$$

câu 3

$\lim_{x\to 2} cosx^{cotx}$= bâm máy thẳng x=2 ra câuC

câu 4 TXĐ

y=$\frac{\arccos\left(\ln\left(\frac{x}{e}\right)\right)}{4arctanx-\pi}$

$\begin{cases}-1\le \ln\left(\frac{x}{e}\right)\le 1\\ x\ne \arctan\left(\frac{\pi}{4}\right)\end{cases}\begin{cases}e^{-1}\le\left(\frac{x}{e}\right)\le e\\ x\ne 1\end{cases}\Leftrightarrow\begin{cases}1\le(x)\le e^2\\ x\ne 1\end{cases}$

đáp án C

câu 5

$\lim_{x\to 0} f(x) = \lim_{x\to 0} \frac{e^{2x}-2x-1}{sin^2 x} = \lim_{x\to 0} \frac{2e^{2x}-2}{sin2x} = \lim_{x\to 0} \frac{4e^{2x}}{2cos2x} = 2$

với f(0)=3a-1

ta có $\lim_{x\to 0} f(x)$ = f(0)=3a-1=2=>a=1

câu 6

y=2x$cos^2 x$ tao có $(cos^2 x)'$ =-sin2x

$y^{(20)} = -C_{20}^0 2x(-2^{19})\left(\sin\left(2x+\frac{19}{2\pi}\right)\right) -$

$C_{20}^1 2(-2^{19})\left(\sin\left(2x+\frac{18}{2\pi}\right)\right)$

câu 7 y=arctan($\frac{lnx}{3}$)

$y' = \frac{\left(\frac{lnx}{3}\right)'}{1+\left(\frac{lnx}{3}\right)^2} = \frac{3}{x(9+ln^2 x)}$ => $dy = \frac{3}{x(9+ln^2 x)}dx$

câu 8

xet f(x)=$\sqrt[3]{x}$ =>f'(x)=1/3$(x)^{-\frac{2}{3}}$

với $x_0$=1 $\Delta x = 0.02$

$f(x_0+\Delta x) = f(x_0) + f'(x_0)\,\Delta x = 1+1/3(1)*0.02 = 1+0.02/3$

câu 9

$$\int \frac{dx}{\sqrt{1-x^2}\,arccos^2 x}$$

đặt t=arccosx

dt=-1/($\sqrt{1-x^2}$)dx

=>$\int -\frac{dt}{t^2}$=1/t+c=1/arccosx+c

câu 10

tính y^2=4x vàx-y-1=0 xem lại đề đã .

ta có pt tung độ giao điểm :

$\frac{y^2}{4}$-y-1=0

I=$\int_{2-\sqrt{2}}^{2+\sqrt{2}} -(\frac{y^2}{4}$-y-1)dy

câu 11

A .$\int_{-\infty}^{0} \frac{e^x+1}{e^x} dx$= $\lim_{b\to-\infty} \int_b^0 (1+e^{-x})dx$= $\lim_{b\to-\infty} (0-$ $e^{-b})_b^0$=−∞ PK

B. $\int_0^{\infty} e^x dx$=$\lim_{b\to\infty} \int_0^{\infty} e^x dx$=$\lim_{b\to\infty}(e^b - e^0) = +\infty$ PK

C. Tích phân suy rộng loại 2 không thi bỏ

=> D

câu 12

ta có

$U_1$=$\frac{1}{3}$=$\frac{1}{1.3}$=$\frac{1}{2}$ (1-1/3)

$U_1$=$\frac{1}{8}$=$\frac{1}{2.4}$=$\frac{1}{2}$ (1/2-1/4)

$U_3$=$\frac{1}{15}$=$\frac{1}{5.3}$=$\frac{1}{2}$ (1/3-1/5)

$U_n$=$\frac{1}{n.(n+2)}$=1/2(1/n-1/(n+2))

ta có Sn= $U_1$+ $U_2$+ $U_3$+....+ $U_n$

Sn=$\frac{1}{2}$(1-$\frac{1}{3}+\frac{1}{2}-\frac{1}{4}+\frac{1}{3}-\frac{1}{5}+\cdots\ldots+\frac{1}{n}-\frac{1}{n+2}$)

Lim Sn=$\frac{1}{2}*\left(1+\frac{1}{2}\right)=3/4$

câu 13

A $\sum_{n=1}^{\infty}\frac{e^n n!}{n^n}$

xét $\lim_{n\to\infty}\frac{U(n+1)}{Un}=\lim_{n\to\infty}\frac{e^{n+1}(n+1)!}{(n+1)^{n+1}}*\frac{n^n}{e^n n!}$= $\lim_{n\to\infty}$ e.$\frac{\mathrm{n+1}}{\mathrm{n+1}}$=$e$ >1 PK

B.$\sum_{n=1}^{\infty}(-1)^n\left(\frac{n}{n-1}\right)^n$

$\lim_{n\to\infty}\sqrt[n]{(-1)^n\left(\frac{n}{n-1}\right)^n}=\lim_{n\to\infty}-\frac{n}{n-1}$ =-1<1 HT

câu 14

$$\sum_{n=1}^{\infty}\frac{n^3}{\sqrt{2^n}}$$

xét $\lim_{n\to\infty}\frac{U(n+1)}{Un}$=$\frac{(n+1)^3}{2^{\left(\frac{1}{2}\right)(n+1)}}\frac{2^{n/2}}{n^3}$=$\frac{1}{\sqrt{2}}$ <1 HT

câu B đã làm HT vì có Sn=3/4

câu C

$$\sum_{n=1}^{\infty}\frac{\sqrt[n]{3}+1}{n\sqrt{n}-1}$$

xet $\lim_{n\to\infty}Un=\lim_{n\to\infty}\frac{3^{1/n}+1}{n\sqrt{n}-1}$= $\lim_{n\to\infty}\frac{\frac{1}{n}ln3+2}{n\sqrt{n}-1}$= $\lim_{n\to\infty}\frac{-\frac{1}{n^2}ln3}{3/2\sqrt{n}}$=0 HT

=> câu |D PK

câu 15$\sum_{n=1}^{\infty} \frac{(n!)^2}{(2n)!}(2x)^n$

$\rho = \lim_{n\to\infty} \frac{U(n+1)}{Un} = \lim_{n\to\infty} \frac{((n+1)!)^2(2n)!}{(2n+2)!(n!)^2} = \lim_{n\to\infty} \frac{(n+1)^2}{(2n+2)(2n+1)} = 1/4$

R=1/ ρ=4

đề 3

câu 1

$$\lim_{x\to)0-} \frac{2^x - cos2x}{x}$$

$\lim_{x\to)0-} \frac{ln2 2^x + sin2x}{1} = \ln 2$

câu 2

$\lim_{x\to\infty} (1+e^x)^{\frac{1}{x^2}} = e^{\lim_{x\to)\infty} (1+e^x-1)\frac{1}{x^2}} = e^{\lim_{x\to)\infty} \frac{e^x}{2x}} = e^{\lim_{x\to)\infty} \frac{e^x}{2}} = +\infty$

câu 3

$\lim_{x\to\infty} \frac{x^2-2}{x^4-x^2-2} = \lim_{x\to\infty} \frac{x^2-2}{(x^2-2)(x^2+1)} = \frac{1}{\infty} = 0$

câu 4

$\lim_{x\to 2-} f(x) = \lim_{x\to 2-} arctan \frac{1}{x^2-4x+4} = \lim_{x\to 2-} arctan \frac{1}{(x-2)^2} = \frac{\pi}{2}$

$\lim_{x\to 2+} f(x) = \lim_{x\to 2+} \frac{x^2-a^2}{x^2+1}$=$\frac{4-a^2}{5}$

ta có $\frac{4-a^2}{5} = \frac{\pi}{2}$=> đáp án khác.

câu 5 y=arccosx

dy=y'dx=$\frac{-1}{\sqrt{1-x^2}}$dx =>dy(1/2)=-2/$\sqrt{3}$

câu 6

vi phân y=(4x)^x

lny=xln4x

y'/y=ln4x+1

y'=(ln4x+1)$(4x)^x$

câu 7 ko có đề

câu 8

$$\begin{cases} x = 2e^t => x = 2 => t = 0 \\ y = 1 + t\text{^}2 \end{cases}$$

y'(x)=$\frac{Y'(t)}{x'(t)} = \frac{2t}{2e^t}$ y'(t=0) =0

câu 9

$\int \frac{2e^x}{\sqrt{2+2e^x+e2^x}}$dx = $\int \frac{2e^x}{\sqrt{1+(e^x+1)^2}}$dx

đặt t=$e^x + 1$=>dt=e^xdx

$\int \frac{2dt}{\sqrt{1+t^2}}$=2arcsint+c =2arcsin($e^x+1$)+C

câu 10

$\int_{\pi/4}^{3\pi/4} \frac{dx}{cosxsinx}=\int_{\pi/4}^{3\pi/4} \frac{sin^2x+cos^2x}{cosxsinx}dx=\int_{\pi/4}^{3\pi/4}(tanx+cotx)dx$=-ln(cosx)+lnx(sinx)$\Big|_{\frac{\pi}{4}}^{\frac{3\pi}{4}}$=ln(tanx) $\Big|_{\frac{\pi}{4}}^{\frac{3\pi}{4}}$

câu 11

$$\int_0^{+\infty} \frac{dx}{(1+x)^2}$$

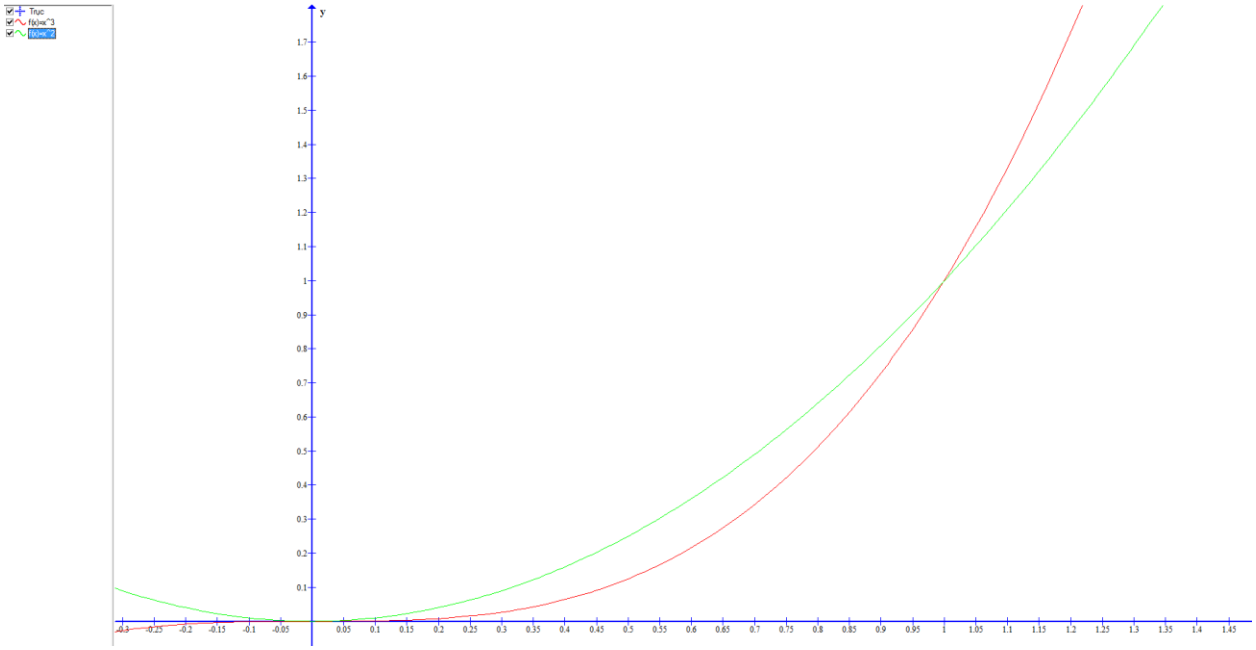
$\lim\limits_{b\to+\infty} \int_0^b \frac{dx}{(1+x)^2}=\lim\limits_{b\to+\infty}\left(-\frac{1}{1+b}+\frac{1}{1+0}\right)=1$ =>HT

câu 12

pt hoành độ giao điểm y=X^3 và y=x^2

có 2 no là x=0 và x=1

$\int_0^1(x^2-x^3)dx$=1/12



câu 13

$V = \pi \int_{\frac{3}{4}}^{2} x\mathrm{dx} = \pi \left(\frac{2^2}{2} - \frac{9}{8}\right)$

câu 14

$$\sum_{n=0}^{\infty} \frac{2 + (-1)^n}{3^n}$$

$\mathrm{Sn} = 2 \frac{\frac{1}{3}^0}{1 - \frac{1}{3}} + \frac{\left(-\frac{1}{3}\right)^0}{1 - \frac{1}{3}} = \frac{15}{4}$

Câu 15

A $\sum_{n=1}^{\infty} \frac{n+1}{n(\sqrt{n}+1)}$

xét lim Un= $\lim_{n \to \infty} \frac{n+1}{n(\sqrt{n}+1)} = \frac{1}{\sqrt{n}}$ do anpha=1/2<1 => PK