KALKULUA – MINTEGIETAKO KONTROL 1 (A eredua)

IZEN-ABIZENAK:
TALDEA:

1.- Aurkitu $f(x)=\dfrac{\arccos\left(\dfrac{|x|}{2}\right)}{\sqrt{\mathrm{L}x}}$ **funtzioaren definizio-eremua**

(1.5 puntu)

$$D=\left\{x\in\mathbb{R}\,/\,-1\le\frac{|x|}{2}\le 1,\ \mathrm{L}x>0,\ x>0\right\}$$

$$-1\le\frac{|x|}{2}\le 1 \quad\Leftrightarrow\quad -2\le|x|\le 2 \quad\Leftrightarrow\quad |x|\le 2 \quad\Leftrightarrow\quad -2\le x\le 2$$

$$\mathrm{L}x>0 \quad\Leftrightarrow\quad x>1$$

Beraz, $D=(1,2]$

2.- Kalkulatu $\lim\limits_{x\to 1}(2-x)^{\tan\left(\frac{\pi x}{2}\right)}$

(Puntu 1)

$$\lim_{x\to 1}(2-x)^{\tan\left(\frac{\pi x}{2}\right)}=1^{\pm\infty}=A \quad\Leftrightarrow\quad \mathrm{L}A=\lim_{x\to 1}\tan\left(\frac{\pi x}{2}\right)\cdot\mathrm{L}(2-x)\sim\lim_{x\to 1}\frac{\sin\left(\frac{\pi x}{2}\right)}{\cos\left(\frac{\pi x}{2}\right)}\cdot(2-x-1)=$$

$$=\lim_{x\to 1}\frac{(1-x)}{\cos\left(\frac{\pi x}{2}\right)}\overset{(\mathrm{L'H})}{=}\lim_{x\to 1}\frac{-1}{-\frac{\pi}{2}\cdot\sin\left(\frac{\pi x}{2}\right)}=\frac{2}{\pi} \quad\Leftrightarrow\quad A=e^{2/\pi}$$

KALKULUA – MINTEGIETAKO KONTROL 1 (B eredua)

IZEN-ABIZENAK:
TALDEA:

1.- Aurkitu $f(x)=\dfrac{\mathrm{L}\left(1-|x-2|\right)}{\sqrt{(x-2)(x-4)}}$ **funtzioaren definizio-eremua**

(1.5 puntu)

$$D=\left\{x\in\mathbb{R}\,/\,1-|x-2|>0,\,(x-2)(x-4)>0\right\}$$

$1-|x-2|>0 \quad\Leftrightarrow\quad |x-2|<1 \quad\Leftrightarrow\quad -1<x-2<1 \quad\Leftrightarrow\quad 1<x<3$

$(x-2)(x-4)>0 \quad\Leftrightarrow\quad x\in(-\infty,2)\cup(4,\infty)$

Beraz, $D=(1,2)$

2.- Kalkulatu $\lim\limits_{x\to1}\left(\dfrac{x}{x-1}-\dfrac{1}{\mathrm{L}x}\right)$

(Puntu 1)

$$\lim_{x\to1}\left(\frac{x}{x-1}-\frac{1}{\mathrm{L}x}\right)=\lim_{x\to1}\frac{x\cdot\mathrm{L}x-x+1}{(x-1)\cdot\mathrm{L}x}\sim\lim_{x\to1}\frac{x\cdot\mathrm{L}x-x+1}{(x-1)^2}\overset{(L'H)}{=}\lim_{x\to1}\frac{\mathrm{L}x+x\cdot\frac{1}{x}-1}{2(x-1)}=\lim_{x\to1}\frac{\mathrm{L}x}{2(x-1)}=\frac{1}{2}$$

KALKULUA – MINTEGIETAKO KONTROL 1 (D eredua)

IZEN-ABIZENAK:
TALDEA:

1.- Aurkitu $f(x) = \dfrac{\arcsin\left(|x-2|-2\right)}{\mathrm{L}x}$ **funtzioaren definizio-eremua**

(1.5 puntu)

$$D = \left\{ x \in \mathbb{R} \,/\, -1 \le |x-2| - 2 \le 1,\ \mathrm{L}x \ne 0,\ x > 0 \right\}$$

$\mathrm{L}x \ne 0 \quad \Leftrightarrow \quad x \ne 1$

$$-1 \le |x-2| - 2 \le 1 \quad \Leftrightarrow \quad 1 \le |x-2| \le 3 \quad \Leftrightarrow \quad \begin{cases} \forall x \ge 2 & 1 \le x-2 \le 3 \quad \Leftrightarrow \quad 3 \le x \le 5 \\ \forall x < 2 & 1 \le 2-x \le 3 \quad \Leftrightarrow \quad -1 \le x \le 1 \end{cases} \quad \Leftrightarrow$$

$$\Leftrightarrow \quad x \in [-1,1] \cup [3,5]$$

Beraz, $D = (0,1) \cup [3,5]$

2.- Kalkulatu $\lim\limits_{x\to 0}\left(\left(\dfrac{1}{x}\right)^2 - \dfrac{\cot x}{x}\right)$

(Puntu 1)

$$\lim_{x\to 0}\left(\left(\frac{1}{x}\right)^2 - \frac{\cot x}{x}\right) = \lim_{x\to 0}\left(\frac{1}{x^2} - \frac{\cos x}{x\cdot\sin x}\right) = \lim_{x\to 0}\frac{\sin x - x\cdot\cos x}{x^2\cdot\sin x} \sim \lim_{x\to 0}\frac{\sin x - x\cdot\cos x}{x^3} \overset{(\mathrm{L'H})}{=}$$

$$\overset{(\mathrm{L'H})}{=} \lim_{x\to 0}\frac{\cos x - \cos x + x\cdot\sin x}{3x^2} = \frac{1}{3}$$

KALKULUA – MINTEGIETAKO KONTROL 1 (E eredua)

IZEN-ABIZENAK:
TALDEA:

1.- Aurkitu $f(x)=\dfrac{\mathrm{L}\left(\arcsin x\right)}{\sqrt{\left|x-\frac{1}{2}\right|}}$ **funtzioaren definizio-eremua**

(1.5 puntu)

$$D=\left\{x\in\mathbb{R}\ /\ \arcsin x>0,\ -1\le x\le 1,\ \left|x-\frac{1}{2}\right|\ne 0\right\}$$

$\arcsin x>0 \quad\Leftrightarrow\quad x>0$

$\left|x-\frac{1}{2}\right|\ne 0 \quad\Leftrightarrow\quad x-\frac{1}{2}\ne 0 \quad\Leftrightarrow\quad x\ne\frac{1}{2}$

Beraz, $D=\left(0,1\right]-\left\{\frac{1}{2}\right\}$

2.- Kalkulatu $\lim\limits_{x\to 0}\left(\sqrt{1+x^2}\right)^{2\ /\ \sin\left(x^2\right)}$

(Puntu 1)

$$\lim_{x\to 0}\left(\sqrt{1+x^2}\right)^{2\ /\ \sin\left(x^2\right)}=1^{\infty}=A \quad\Leftrightarrow$$

$$\Leftrightarrow\quad \mathrm{L}A=\lim_{x\to 0}\frac{2}{\sin\left(x^2\right)}\cdot\mathrm{L}\left(\sqrt{1+x^2}\right)=\lim_{x\to 0}\frac{2}{\sin\left(x^2\right)}\cdot\frac{1}{2}\mathrm{L}\left(1+x^2\right)=\lim_{x\to 0}\frac{\mathrm{L}\left(1+x^2\right)}{\sin\left(x^2\right)}\sim$$

$$\sim\lim_{x\to 0}\frac{x^2}{x^2}=1 \quad\Leftrightarrow\quad A=e$$

KALKULUA – MINTEGIETAKO KONTROL 1 (bigarren aukera)

A EREDUA

Aurkitu $f(x)=\dfrac{\sqrt{\mathrm{L}\left(10-x^2\right)}}{\arcsin(x-3)}$ **funtzioaren definizio-eremua**

$$D=\left\{x\in\mathbb{R}\,/\,10-x^2>0,\ \mathrm{L}\left(10-x^2\right)\geq 0,\ \arcsin(x-3)\neq 0,\ -1\leq x-3\leq 1\right\}$$

$10-x^2>0 \quad\Leftrightarrow\quad x^2<10 \quad\Leftrightarrow\quad |x|<\sqrt{10} \quad\Leftrightarrow\quad -\sqrt{10}<x<\sqrt{10}$

$\mathrm{L}\left(10-x^2\right)\geq 0 \quad\Leftrightarrow\quad 10-x^2\geq 1 \quad\Leftrightarrow\quad x^2\leq 9 \quad\Leftrightarrow\quad |x|\leq 3 \quad\Leftrightarrow\quad -3\leq x\leq 3$

$\arcsin(x-3)\neq 0 \quad\Leftrightarrow\quad x-3\neq 0 \quad\Leftrightarrow\quad x\neq 3$

$-1\leq x-3\leq 1 \quad\Leftrightarrow\quad 2\leq x\leq 4$

Beraz, $D=[2,3)$

B EREDUA

Aurkitu $f(x)=\dfrac{\sqrt{\arctan(3-x)}}{\mathrm{L}\left(|x|-1\right)}$ **funtzioaren definizio-eremua**

$$D=\left\{x\in\mathbb{R}\,/\,\arctan(3-x)\geq 0,\ |x|-1>0,\ \mathrm{L}\left(|x|-1\right)\neq 0\right\}$$

$\arctan(3-x)\geq 0 \quad\Leftrightarrow\quad 3-x\geq 0 \quad\Leftrightarrow\quad x\leq 3$

$|x|-1>0 \quad\Leftrightarrow\quad |x|>1 \quad\Leftrightarrow\quad x\in(-\infty,-1)\cup(1,\infty)$

$\mathrm{L}\left(|x|-1\right)\neq 0 \quad\Leftrightarrow\quad |x|-1\neq 1 \quad\Leftrightarrow\quad |x|\neq 2 \quad\Leftrightarrow\quad x\neq\pm 2$

Beraz, $D=(-\infty,-2)\cup(-2,-1)\cup(1,2)\cup(2,3]$

D EREDUA

Aurkitu $f(x)=\dfrac{\mathrm{L}\left(\arctan(x-1)\right)}{1-e^{x-2}}+\sqrt{3-|x|}$ **funtzioaren definizio-eremua**

$$D=\left\{x\in\mathbb{R}\ /\ \arctan(x-1)>0,1-e^{x-2}\neq 0,3-|x|\geq 0\right\}$$

$\arctan(x-1)>0 \quad \Leftrightarrow \quad x-1>0 \quad \Leftrightarrow \quad x>1$

$1-e^{x-2}\neq 0 \quad \Leftrightarrow \quad e^{x-2}\neq 1 \quad \Leftrightarrow \quad x-2\neq 0 \quad \Leftrightarrow \quad x\neq 2$

$3-|x|\geq 0 \quad \Leftrightarrow \quad |x|\leq 3 \quad \Leftrightarrow \quad -3\leq x\leq 3$

Beraz, $D=(1,3]-\{2\}$

E EREDUA

Aurkitu $f(x)=\dfrac{(x-1)^{\arcsin(1-x)}}{\sqrt{|x-2|}}$ **funtzioaren definizio-eremua**

$$D=\left\{x\in\mathbb{R}\ /\ x-1>0,-1\leq 1-x\leq 1,|x-2|\neq 0\right\}$$

$x-1>0 \quad \Leftrightarrow \quad x>1$

$-1\leq 1-x\leq 1 \quad \Leftrightarrow \quad 0\leq x\leq 2$

$|x-2|\neq 0 \quad \Leftrightarrow \quad x-2\neq 0 \quad \Leftrightarrow \quad x\neq 2$

Beraz, $D=(1,2)$