KALKULUA – MINTEGIETAKO 1. KONTROLA (A eredua)

IZEN-ABIZENAK:
TALDEA:

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

(1.5 puntu)

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

$-1\leq x\leq 1$

$\arcsin x\geq 0 \quad\Leftrightarrow\quad x\geq 0$

$1-\mathrm{L}\left(3-x\right)\neq 0 \quad\Leftrightarrow\quad \mathrm{L}\left(3-x\right)\neq 1 \quad\Leftrightarrow\quad 3-x\neq e \quad\Leftrightarrow\quad x\neq 3-e$

$3-x>0 \quad\Leftrightarrow\quad x<3$

$$D=\left[0,1\right]-\left\{3-e\right\}$$

2.- Kalkulatu $\lim\limits_{x\to\infty}\dfrac{\sin\left(\dfrac{\pi x^3}{4x^3+3}\right)\cdot\mathrm{L}\left(1+\dfrac{1}{2x}\right)}{\left(x^3+2x-3\right)\cdot\arctan^4\left(\dfrac{1}{x}\right)}$

(Puntu 1)

$$\lim_{x\to\infty}\frac{\sin\left(\dfrac{\pi x^3}{4x^3+3}\right)\cdot\mathrm{L}\left(1+\dfrac{1}{2x}\right)}{\left(x^3+2x-3\right)\cdot\arctan^4\left(\dfrac{1}{x}\right)}=\lim_{x\to\infty}\frac{\sin\left(\dfrac{\pi}{4}\right)\cdot\dfrac{1}{2x}}{x^3\cdot\dfrac{1}{x^4}}=\frac{\sqrt{2}}{2}\cdot\frac{1}{2}=\frac{\sqrt{2}}{4}$$

KALKULUA – MINTEGIETAKO 1. KONTROLA (B eredua)

IZEN-ABIZENAK:

TALDEA:

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

(1.5 puntu)

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

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

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

$|x|-1>0 \quad \Leftrightarrow \quad |x|>1 \quad \Leftrightarrow \quad x>1 \quad \vee \quad x<-1$

$$D=(-\infty,-1)\cup\left(1,3\right]-\left\{-2,2\right\}=(-\infty,-2)\cup(-2,-1)\cup(1,2)\cup\left(2,3\right]$$

2.- Kalkulatu $\displaystyle\lim_{x\to\infty}\frac{\sin\left(\frac{3}{x}\right)\cdot \mathrm{L}\left(1+\tan^2\left(\frac{4}{x}\right)\right)}{\arctan\left(\frac{7}{x}\right)\cdot\left(1-\cos\left(\frac{2}{x}\right)\right)}$

(Puntu 1)

$$\lim_{x\to\infty}\frac{\sin\left(\frac{3}{x}\right)\cdot \mathrm{L}\left(1+\tan^2\left(\frac{4}{x}\right)\right)}{\arctan\left(\frac{7}{x}\right)\cdot\left(1-\cos\left(\frac{2}{x}\right)\right)}=\lim_{x\to\infty}\frac{\frac{3}{x}\cdot\frac{16}{x^2}}{\frac{7}{x}\cdot\frac{\left(\frac{2}{x}\right)^2}{2}}=\frac{48}{14}=\frac{24}{7}$$

KALKULUA – MINTEGIETAKO 1. KONTROLA (D eredua)

IZEN-ABIZENAK:

TALDEA:

1.- Aurkitu $f(x)=\dfrac{\arcsin\left(\dfrac{|x|}{9}\right)}{\mathrm{L}(|x|)}$ **funtzioaren definizio-eremua**

(1.5 puntu)

$$D=\left\{x\in\mathbb{R}\ /\ -1\le\frac{|x|}{9}\le 1,\ \mathrm{L}(|x|)\ne 0,\ |x|>0\right\}$$

$|x|>0 \quad \Leftrightarrow \quad x\ne 0$

$-1\le\dfrac{|x|}{9}\le 1 \quad \Leftrightarrow \quad -9\le|x|\le 9 \quad \Leftrightarrow \quad |x|\le 9 \quad \Leftrightarrow \quad -9\le x\le 9$

$\mathrm{L}(|x|)\ne 0 \quad \Leftrightarrow \quad |x|\ne 1 \quad \Leftrightarrow \quad x\ne\pm 1$

$$D=[-9,9]-\{-1,0,1\}=[-9,-1)\cup(-1,0)\cup(0,1)\cup(1,9]$$

2.- Kalkulatu $\displaystyle\lim_{x\to\infty}\frac{\sin^2\left(\frac{2}{x}\right)\cdot\arctan\left(\frac{1}{x}\right)\cdot\arctan x}{\left(x^2+3x-10\right)\cdot\mathrm{L}\left(1+\frac{4}{x^5}\right)}$

(Puntu 1)

$$\lim_{x\to\infty}\frac{\sin^2\left(\frac{2}{x}\right)\cdot\arctan\left(\frac{1}{x}\right)\cdot\arctan x}{\left(x^2+3x-10\right)\cdot\mathrm{L}\left(1+\frac{4}{x^5}\right)}=\lim_{x\to\infty}\frac{\frac{4}{x^2}\cdot\frac{1}{x}\cdot\frac{\pi}{2}}{x^2\cdot\frac{4}{x^5}}=\frac{\pi}{2}$$

KALKULUA – MINTEGIETAKO 1. KONTROLA (E eredua)

IZEN-ABIZENAK:
TALDEA:

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

(1.5 puntu)

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

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

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

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

$$D = (1,2)$$

2.- Kalkulatu $\lim\limits_{x\to\infty} \dfrac{\dfrac{1}{x}\cdot \sin\left(\dfrac{1}{x}\right)\cdot \cos\left(\dfrac{\pi x+1}{x}\right)}{\left(x^2+\mathrm{L}x\right)\cdot \mathrm{L}\left(1+\dfrac{4}{x^2}\right)\cdot \arcsin\left(\dfrac{2}{x^2}\right)}$

(Puntu 1)

$$\lim_{x\to\infty} \frac{\dfrac{1}{x}\cdot \sin\left(\dfrac{1}{x}\right)\cdot \cos\left(\dfrac{\pi x+1}{x}\right)}{\left(x^2+\mathrm{L}x\right)\cdot \mathrm{L}\left(1+\dfrac{4}{x^2}\right)\cdot \arcsin\left(\dfrac{2}{x^2}\right)} = \lim_{x\to\infty} \frac{\dfrac{1}{x}\cdot\dfrac{1}{x}\cdot \cos\pi}{x^2\cdot\dfrac{4}{x^2}\cdot\dfrac{2}{x^2}} = \frac{-1}{8}$$