Ενότητα 24

4. $f(x) = x^2 + \ln x - 1 \quad , x>0$

$f'(x) = 2x + \frac{1}{x} > 0$

$f \nearrow$

(α) $f(x)=0$

$f(x)=f(1)$

f 1-1

$x=1$

x	0	1	
$f(x)$	$\nearrow \; -$	0	$+ \; \nearrow$

$x<1 \Rightarrow f(x)<f(1) \Rightarrow f(x)<0$

$x>1 \Rightarrow f(x)>f(1) \Rightarrow f(x)>0$

(β) $(x^2+1)^2 + \ln(x^2+1) = 1$

$f(x^2+1) = 0$

$f(x^2+1) = f(1)$

f 1-1

$x^2+1 = 1$

$x^2 = 0$

$\boxed{x=0}$

(γ) $xe^{x^2} > e$ $\qquad (0,+\infty)$

$\ln xe^{x^2} > \ln e$

$\ln x + \ln e^{x^2} > 1$

$\ln x + x^2 > 1$

$\ln x + x^2 - 1 > 0$

$f(x) > 0 \Rightarrow f(x) > f(1) \Rightarrow \underline{\underline{x > 1}}$

(δ) $\ln \frac{x^2+1}{x+1} > (x+1)^2 - (x^2+1)^2$

$\ln(x^2+1) - \ln(x+1) > (x+1)^2 - (x^2+1)^2$

$\ln(x^2+1) + (x^2+1)^2 - 1 > \ln(x+1) + (x+1)^2 - 1$

$f(x^2+1) > f(x+1)$

$\forall x > 0$
$x+1 > 0$
$x^2+1 > 0$

$f\uparrow$

$x^2+1 > x+1$

$x^2 - x > 0$

x		0		1	
x^2-x	+		−		+

$x \in (-\infty, 0) \cup (1, +\infty)$.

5. $f(x) = \dfrac{x^3}{x^2+1}$, $x^2+1 \neq 0$ $D_f = \mathbb{R}$.

ⓐ $f'(x) = \dfrac{3x^2(x^2+1) - x^3 2x}{(x^2+1)^2} = \dfrac{3x^4+3x^2-2x^4}{(x^2+1)^2}$

$f'(x) = \dfrac{x^4+3x^2}{(x^2+1)^2} \geq 0$ $f \nearrow$

ⓑ i) $f(5x^3) > f(8x^2+8)$

$f \nearrow$

$5x3 > 8x^2+8$.

$5x3 > 8(x^2+1)$

$\dfrac{x^3}{x^2+1} > \dfrac{8}{5}$ $\Rightarrow f(x) > f(2)$

$\underline{\underline{x > 2}}$

ii) $(x^2+1) f(e^x-1) - x^3 = 0$

$f(e^x-1) = \dfrac{x^3}{x^2+1}$

$f(e^x-1) = f(x)$

f 1-1

$e^x - 1 = x$ $\rightarrow e^x = x+1$

$x = 0$

(8) $\lim_{x \to 0} \frac{\ln x}{f(2x+1) - f(x+1)} \overset{\frac{\infty}{0}}{=} \lim_{x \to 0^+} \ln x \frac{1}{\underbrace{f(2x+1) - f(x+1)}_{+}}$

$= -\infty \cdot (+\infty) = -\infty$

- $2x > x \Rightarrow 2x+1 > x+1$

$f(2x+1) > f(x+1)$

$f(2x+1) - f(x+1) > 0$

8. $f(x) = e^{1-x} + \ln x - 1 \quad , x>0$

ⓐ $f'(x) = -e^{1-x} + \frac{1}{x} = -\frac{1}{e^{x-1}} + \frac{1}{x} = \frac{\overset{\oplus}{e^{x-1}-x}}{xe^{x-1}} > 0$

• $e^x \geq x+1 \Rightarrow e^{x-1} \geq x-1+1 \Rightarrow e^{x-1} \geq x$

$e^{x-1} - x \geq$

$f \nearrow$

x	0		1	
$f(x)$		$\nearrow$ $-$	0	$\nearrow$ $+$

Ρίζα

$f(x)=0$

$f(x)=f(1)$

f 1-1

$\underline{\underline{x=1}}$

$x<1 \Rightarrow f(x)<f(1) \Rightarrow f(x)<0$

$x>1 \Rightarrow f(x)>f(1) \quad f(x)>0.$

ⓑ i) $e^{1-ημx} - e^{1-συνx} = -\ln εφx \qquad \left(0,\frac{π}{2}\right)$

$e^{1-ημx} - e^{1-συνx} = -\ln\frac{ημx}{συνx}$

$e^{1-ημx} - e^{1-συνx} = -(\ln ημx - \ln συνx)$

$e^{1-ημx} + \ln ημx - 1 = e^{1-συνx} + \ln συνx - 1$

$f(ημx) = f(συνx)$

$ημx = συνx \qquad x = \frac{π}{4}.$

11/. $e^{1-x} - e^{1-x^2} > \ln x$ $\qquad x > 0$

$$e^{1-x} - e^{1-x^2} > \ln \frac{x^2}{x}$$

$$e^{1-x} - e^{1-x^2} > \ln x^2 - \ln x$$

$$e^{1-x} + \ln x - 1 > \ln x^2 + e^{1-x^2} - 1$$

$$f(x) > f(x^2)$$

$$f \nearrow$$

$$x > x^2$$

$$\underline{\underline{1 > x > 0}}$$

γ) $\lim\limits_{x\to 1^+} \dfrac{\ln x}{(x-1)f(x)} = \lim\limits_{x\to 1^+} \dfrac{\ln x}{x-1} \cdot \dfrac{1}{f(x)} = 1 \cdot (+\infty)$

$= +\infty$,

$\to \lim\limits_{x\to 1^+} \dfrac{\ln x}{x-1} = \lim\limits_{x\to 1^+} \dfrac{\frac{1}{x}}{1} = 1$

9. (α) $e^{x^2} + \ln(x^2+1) = 1 \Rightarrow f(x^2) = 0$

$f(x^2) = f(0)$

f 1-1

$x^2 = 0$

$x = 0$

$$\boxed{f(x) = e^x + \ln(x+1) - 1}, \ x > -1$$

$$f'(x) = e^x + \frac{1}{x+1} > 0$$

$f \nearrow$

(B) $\ln \dfrac{x^2+1}{x+1} > e^x - e^{x^2}$

$\ln(x^2+1) - \ln(x+1) > e^x - e^{x^2}$

$\ln(x^2+1) + e^{x^2} > e^x + \ln(x+1)$

$\ln(x^2+1) + e^{x^2} - 1 > e^x + \ln(x+1) - 1$

$f(x^2) > f(x)$

$f \nearrow$

$x^2 > x \Rightarrow x^2 - x > 0$

x	0	1	
$x^2 - x$	+	−	+

$x \in (-\infty, 0) \cup (1, +\infty)$

1) $e^{x^2-1} + \ln x = e^{x-1}$

$e^{x^2-1} + \ln \frac{x^2}{x} = e^{x-1}$

$e^{x^2-1} + \ln x^2 - \ln x = e^{x-1}$

$e^{x^2-1} + \ln x^2 - 1 = \ln x + e^{x-1} - 1$

$f(x^2-1) = f(x-1)$

$f \nearrow 1-1$

$x^2-1 = x-1$

$x^2 = x$

$x^2 - x = 0$

$x(x-1) = 0$

$x=0$ $x=1$

11. (a) $x \ln x = 1 - x^3$, $x > 0$

$$\ln x = \frac{1}{x} - x^2$$

$$\underbrace{\ln x - \frac{1}{x} + x^2}_{} = 0$$

$$f'(x) = \frac{1}{x} + \frac{1}{x^2} > 0$$

$f \nearrow$

$$f(x) = 0$$

$$f(x) = f(1)$$

$$f \text{ 1-1}$$

$$\underline{\underline{x = 1}}$$

(b) $e^{x^3-1} \, x^x > 1$

$$\ln\left(e^{x^3-1} \cdot x^x\right) > \ln 1$$

$$\ln e^{x^3-1} + \ln x^x > 0$$

$$x^3 - 1 + x \ln x > 0$$

$$x^2 - \frac{1}{x} + \ln x > 0$$

$$f(x) > 0$$

$$f(x) > f(1) \qquad \underline{x > 1}$$

13.

$$f(x) = \begin{cases} x\ln x + a, & x > 0 \\ \eta\mu x + \ln(1+a^2), & x \leq 0 \end{cases}$$

<u>συνεχ.</u>

$$\lim_{x \to 0^+} f(x) = \lim_{x \to 0^+} x\ln x + a = 0 + a = a$$

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

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

$$\Rightarrow \ln(1+a^2) = a \quad \Rightarrow \quad g(a) = 0 \Rightarrow g(a) = g(0)$$

$$\underline{\underline{a = 0}}$$

$$\boxed{g(x) = \ln(x^2+1) - x}$$

$$g'(x) = \frac{2x}{x^2+1} - 1 = \frac{2x - x^2 - 1}{x^2+1} = -\frac{x^2 - 2x + 1}{x^2+1}$$

$$g'(x) = -\frac{(x-1)^2}{x^2+1} \leq 0 \qquad g \downarrow \Rightarrow g \text{ 1-1}$$

14. (a) $f(x) = x^2 + 3\ln x \quad , x>0$

$g(x) = 1 + \ln x \quad , x>0 .$

Έστω $f(x) < g(x)$

$$x^2 + 3\ln x < 1 + \ln x$$

$$\underbrace{x^2 + 2\ln x - 1}_{} < 0$$

$$h(x) < 0$$

$$h(x) < h(1)$$

$$h \nearrow$$

$$x < 1$$

$h'(x) = 2x + \frac{2}{x} > 0$

$h \nearrow$

Άρα

Αν $x<1$ τότε C_f κάτω C_g

Αν $x>1$ τότε C_f πάνω C_g

Αν $x=1$ τέμνονται

(1) $f(x) = \ln x \quad , x > 0$

$g(x) = x - \frac{1}{x} \quad , x \neq 0 .$

Εστω $f(x) < g(x)$

$\ln x < x - \frac{1}{x}$

$h'(x) = \frac{1}{x} - 1 - \frac{1}{x^2}$

$\underbrace{\ln x - x + \frac{1}{x}}_{} < 0$

$h'(x) = \frac{x - x^2 - 1}{x^2}$

$h(x) < 0$

$h'(x) = -\frac{\overset{+}{x^2 - x + 1}}{x^2}$

$h(x) < h(1)$

$h \downarrow$

$x > 1$

$h'(x) < 0$

$h \downarrow$

Αρα αν $x > 1$ C_f κατω C_g

αν $x < 1$ C_f πανω C_g

αν $x = 1$ Τεμνονται

15. (α) $x^3+x=\sigma\upsilon\nu x \qquad (0,\frac{\pi}{2})$

$$f(x)=x^3+x-\sigma\upsilon\nu x$$

$$\left.\begin{aligned} f(0)&=-1\\ f\left(\tfrac{\pi}{2}\right)&=\frac{\pi^3}{8}+\frac{\pi}{2}>0\end{aligned}\right\} f(0)f\left(\tfrac{\pi}{2}\right)<0$$

Bolzano $\exists x_0\in\left(0,\frac{\pi}{2}\right)$ τ.ω $f(x_0)=0$.

$$f'(x)=\underset{+}{3x^2}\underbrace{+1+\eta\mu x}_{+}>0$$

$f\nearrow$ οπότε το x_0 μοναδικό

(β) $\ln(e^x-x)=\sigma\upsilon\nu x \qquad (0,\frac{\pi}{2})$

$$\boxed{f(x)=\ln(e^x-x)-\sigma\upsilon\nu x}$$

$$f(0)=-1$$

$$f\left(\tfrac{\pi}{2}\right)=\ln\left(e^{\frac{\pi}{2}}-\tfrac{\pi}{2}\right)>0$$

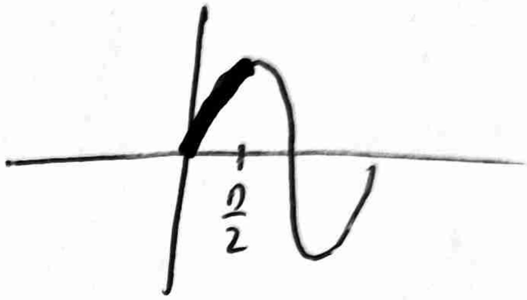
• $e^x\geq x+1 \rightarrow e^{\frac{\pi}{2}}\geq\frac{\pi}{2}+1 \Rightarrow e^{\frac{\pi}{2}}-\frac{\pi}{2}\geq 1$

$$\ln\left(e^{\frac{\pi}{2}}-\tfrac{\pi}{2}\right)\geq 0$$

$f(0)\,f(\frac{\pi}{2})<0$ Bolzano $\exists\, \xi \in (0,\frac{\pi}{2})$

τ.ω $f(\xi)=0$

$$f''(x)=\frac{\overset{+}{e^x-1}}{\underset{+}{e^x-x}}+\underset{+}{\eta\mu x}$$



- $x>0$

$e^x>e^0$

$e^x>1$

$e^x-1>0$

$f \nearrow$

άρα το ξ μοναδικό.

17. $f: (2,+\infty) \longrightarrow \mathbb{R}$

$f(3) = 0$

$f'(x) < 0$

$$(x-2)f(x) + 3 = x$$

$$f(x) = \frac{x-3}{x-2} \Rightarrow f(x) - \frac{x-3}{x-2} = 0$$

$g(x) = 0$

$g(x) = g(3)$

g 1-1

$\underline{\underline{x=3}}$

$$g(x) = f(x) - \frac{x-3}{x-2}$$

$$g'(x) = f'(x) - \frac{x-2-(x-3)}{(x-2)^2}$$

$$g'(x) = \underset{\ominus}{f'(x)} - \frac{1}{(x-2)^2} < 0$$

$g \searrow$

18. (α) $f(2) - f(1) < e^2 - e$

$f'(x) < 0$

$f \downarrow$

$e - f(1) < e^2 - f(2)$

$\boxed{g(x) = e^x - f(x)}$

$g(1) < g(2)$

$g \nearrow$

$1 < 2$

$g'(x) = e^x - f'(x)$

$g'(x) > 0$

$g \nearrow$

(γ) $f(2) + e^2 < f(1) + e^3$

$e^2 - f(1) < e^3 - f(2)$

$\boxed{g(x) = e^{x+1} - f(x)}$

$g(1) < g(2)$

$g \nearrow$

$1 < 2$

$g'(x) = e^{x+1} - f'(x)$

$g'(x) > 0$

$g \nearrow$

19. ⑨ $f(\pi) < e + \cos e + 1$ $\qquad f'(x) < 0$

$f(e) = e$ $\qquad f\downarrow$

$f(\pi) < f(e) + \cos e - \cos \pi$

$f(\pi) + \cos \pi < f(e) + \cos e$

$\boxed{g(x) = f(x) + \cos x}$

$g'(x) = \underset{\ominus}{f'(x)} - \underset{\oplus}{\sin x} < 0$

$g\downarrow$ on $[e, \pi]$

$g(\pi) < g(e)$.

$g\downarrow$

$\pi > e$

Ⓑ $f(1) > \ln \frac{3^{e+1}}{e+2}$ $\qquad f(e) = e\ln 3$

$f(1) > \ln 3^{e+1} - \ln(e+2)$

$f(1) > (e+1)\ln 3 - \ln(e+2)$

$f(1) > e\ln 3 + \ln 3 - \ln(e+2)$

$f(1) > f(e) + \ln 3 - \ln(e+2)$

$f(1) - \ln 3 > f(e) - \ln(e+2)$

$$\boxed{g(x) = f(x) - \ln(x+2)}$$

$g(1) > g(e)$ $\qquad g'(x) = f'(x) - \frac{1}{x+2}$

$g \searrow$ $\qquad g'(x) < 0$

$1 < e$ $\qquad g \searrow$

20. ⓐ $5^x + 12^x = 13^x$

$$\underbrace{\left(\frac{5}{13}\right)^x + \left(\frac{12}{13}\right)^x - 1}_{f(x)} = 0$$

$f(x) = f(2)$

$f(2) = 1$

$\underline{\underline{x = 2}}$.

- $x_1 < x_2 \Rightarrow \left(\frac{5}{13}\right)^{x_1} > \left(\frac{5}{13}\right)^{x_2}$ $+$

- $x_1 < x_2 \Rightarrow \left(\frac{12}{13}\right)^{x_1} > \left(\frac{12}{13}\right)^{x_2}$

$f \downarrow$

23. (a) $e^x = (e-1)x + 1$

$$\underbrace{e^x - (e-1)x - 1}_{f(x)} = 0 \Rightarrow f(x) = 0$$

$x = 1$, $x = 0$

προφανείς ρίζες

$f'(x) = e^x - (e-1)$

$\rightarrow e^x - (e-1) = 0$

$e^x = e - 1$

$x = \ln(e-1)$

x		$\ln(e-1)$	
f'	$-$	0	$+$
f	$\searrow$		$\nearrow$

Αφού έχω δύο διαστήματα μονοτονίας έχω το πολύ 2 ρίζες. και αφού έχω βρει ήδη 2 έχω 2.

25. $f(x)=x^6-6x+7$

(α) $f'(x)=6x^5-6 \quad =6(x^5-1)$

x		1	
f'	$-$	0	$+$
f	$\searrow$		$\nearrow$

$f(x)\geq f(1)$

$\underline{\underline{f(x)\geq 2}}$

(β) i) $\frac{1}{5}>\frac{1}{7}$

$f\downarrow$

$f(\frac{1}{5})<f(\frac{1}{7})$

ii) $\pi>3$

$f\nearrow$

$f(\pi)>f(3)$

(γ) Αν $x<1$ ν.δ.ο $f(x)>2$

Αν $x<1 \Rightarrow f(x)>f(1) \Rightarrow \underline{\underline{f(x)>2}}$

(δ) Αν $x\in[1,2)$ ν.δ.ο $2\leq f(x)<56$

$1\leq x<2$

$f\nearrow$

$f(1)\leq f(x)\leq f(2)$

$2\leq f(x)\leq 59$.

26. α) $f(x) = x^3 - 6x^2 + 9x - 3$

$f'(x) = 3x^2 - 12x + 9$

$f'(x) = 3(x^2 - 4x + 3)$

x		1		3	
f'	$+$		$-$		$+$
f	$\nearrow$		$\searrow$		$\nearrow$

β) $e < 3$

$f \downarrow$

$f(e) > f(3)$

γ) i) $f(ημx) = f(συνx)$

$\left\{ \begin{array}{l} ημx \in [-1, 1] \\ συνx \in [-1, 1] \end{array} \right. \quad \forall x \in \mathbb{R}.$

$f \downarrow \Rightarrow f$ 1-1

$ημx = συνx$

$ημx = ημ\left(\frac{π}{2} - x\right)$

$x = 2κπ + \frac{π}{2} - x$ ή $\cancel{x} = 2κπ + π - \frac{π}{2} \cancel{+x}$

Αδύνατη

$2x = 2κπ + \frac{π}{2}$

$x = κπ + \frac{π}{4}$

11) $f(3+x^2) < f(3+2x^2)$

$$\left.\begin{array}{l} x^2+3 > 3 \\ 2x^2+3 > 3 \end{array}\right\} f \nearrow \quad \forall x > 3.$$

$$\downarrow$$

$3+x^2 < 3+2x^2$

$x^2 < 2x^2$

$0 < x^2$

$x \in \mathbb{R} - \{0\}.$

28. $f(x) = \begin{cases} -x^3, & x < 0 \\ 2x - x^2, & x \geq 0. \end{cases}$

(α) $\left.\begin{array}{l} \lim\limits_{x \to 0^-} f(x) = 0 \\ \lim\limits_{x \to 0^+} f(x) = 0 \end{array}\right\} \lim\limits_{x \to 0} f(x) = 0 \qquad f(0) = 0.$

Συνεχής στο 0.

$\underline{x < 0}$

$f_1(x) = -x^3$

$f_1'(x) = -3x^2 < 0$

$x = 0$

$\underline{x > 0}$

$f_2(x) = 2x - x^2$

$f_2'(x) = 2 - 2x$

$\to 2 - 2x = 0$

$2 = 2x$

$x = 1$

x		0		1	
f_1'	$-$		//////		//////
f_2'	//////		$+$	0	$-$
f'	$-$		$+$		$-$
f	$\searrow$		$\nearrow$		$\searrow$

(B) $f(-2x) > f(-x^2)$ $\qquad (0,+\infty)$

- $x>0 \Rightarrow -2x<0$
- $x>0 \Rightarrow x^2>0 \Rightarrow -x^2<0$

$\forall x<0 \quad \eta \quad f \downarrow$

$$-2x < -x^2$$

$$x^2-2x<0$$

x		0		2	
x^2-2x	+	|	−	|	+

$x \in (0,2)$.

(γ) $f(e^x) = f\left(\frac{1}{2}\right)$ $\qquad (-1, 0)$

- $-1 < x < 0 \rightarrow e^{-1} < e^x < e^0 \Rightarrow \frac{1}{e} < e^x < 1$
- $\frac{1}{2} < 1$ $\qquad \forall x \in (0,1)$

$f \nearrow$

$e^x = \frac{1}{2}$

$x = \ln\frac{1}{2}$

(δ) Νδο $f(x+1) > f(e^x)$ $\forall x > 0$

- $x > 0 \Rightarrow x+1 > 1$
- $x > 0 \rightarrow e^x > e^0 \Rightarrow e^x > 1$

$\forall x > 1$ η $f \searrow$.

$x+1 < e^x$ που ισχύει!

40 $f(x) = e^{x}(x^2+3)$

Σχόλιο

Όταν $\Delta<0$ το τριώνυμο διατηρεί σταθερό πρόσημο ομόσημο του α.

(α) $f'(x) = e^x(x^2+3) + 2xe^x$

$f'(x) = e^x(x^2+2x+3)$

$f''(x) = e^x(x^2+2x+3) + e^x(2x+2)$

$f''(x) = e^x(x^2+4x+5) > 0 \quad f' \nearrow$.

$\Delta<0$

(β) $f(2x^2) + 2f(x+2) > f(2x+4) + 2f(x^2) \quad , x>0$

$f(2x^2) - 2f(x^2) > f(2x+4) - 2f(x+2)$

$$\boxed{g(x) = f(2x) - 2f(x)}$$

$g'(x) = 2f'(2x) - 2f'(x)$

• $x<2x \Rightarrow f'(x) < f'(2x)$

$f'(2x) - f'(x) > 0$

$g'>0$

$g \nearrow$

$g(x^2) > g(x+2)$

$g \nearrow$

$x^2 > x+2$

$x^2 - x - 2 > 0$

$x \in (-\infty, -1) \cup (2, +\infty)$

x		-1		2	
x^2-x-2	$+$		$-$		$+$

(8) $f(2x^4+6) - f(2x^2+6) = 2f(x^4+3) - 2f(x^2+3)$

$$f(2x^4+6) - 2f(x^4+3) = f(2x^2+6) - 2f(x^2+3)$$

$$g(x^4+3) = g(x^2+3)$$

$$g \text{ } 1\text{-}1$$

$$x^4+3 = x^2+3$$

$$x^4 = x^2$$

$$x^4 - x^2 = 0$$

$$x^2(x^2-1) = 0$$

$x=0$ $\quad$ $x=1$ $\quad$ $x=-1$

44. $f(x) = 2e^x - 1$, $x \geq 0$ $\qquad f'(x) = 2e^x$

$g(x) = -x^2$ $\qquad g'(x) = -2x$

$$\begin{cases} f'(a) = g'(B) \\ f(a) - a f'(a) = g(B) - B g'(B) \end{cases}$$

$$\begin{cases} 2e^a = -2B \quad \Rightarrow B = e^a \\ 2e^a - 1 - a \cdot 2e^a = -B^2 - B(-2B) \end{cases}$$

$$2e^a - 1 - 2ae^a = -e^{2a} + 2e^{2a}$$

$$2e^a(1-a) - 1 = e^{2a}$$

$$e^{2a} - 2e^a(1-a) + 1 = 0$$

$$e^{2a} + 2e^a(a-1) + 1 = 0.$$

$$\varphi(x) = e^{2x} + 2e^{x}(x-1) + 1$$

$$\varphi'(x) = 2e^{2x} + 2e^{x}(x-1) + 2e^{x}$$

$$\varphi'(x) = e^{x}\left(2e^{x} + 2(x-1) + 2\right)$$

$$\varphi'(x) = 2e^{x}\left(e^{x} + x + 1\right) > 0 \quad \forall x > 0$$

$\varphi \nearrow$

Άρα η εξίσωση $e^{2a} + 2e^{a}(a-1) + 1 = 0$

$\varphi(a) = \varphi(0)$

$\varphi \nearrow$

$\underline{a = 0}$

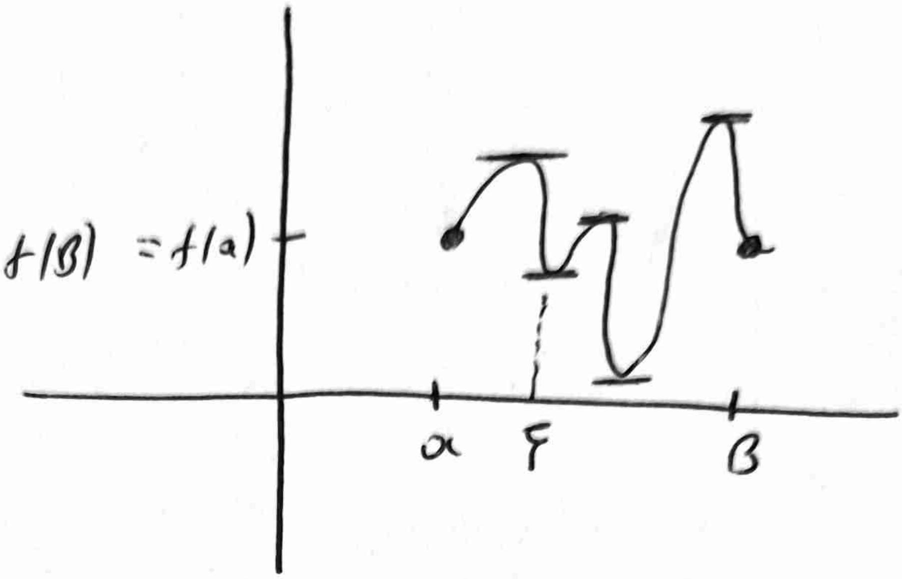
$y - f(0) = f'(0)(x-0)$

$y - 1 = 2x$

$\underline{y = 2x + 1}$

Ενότητα 20

Rolle



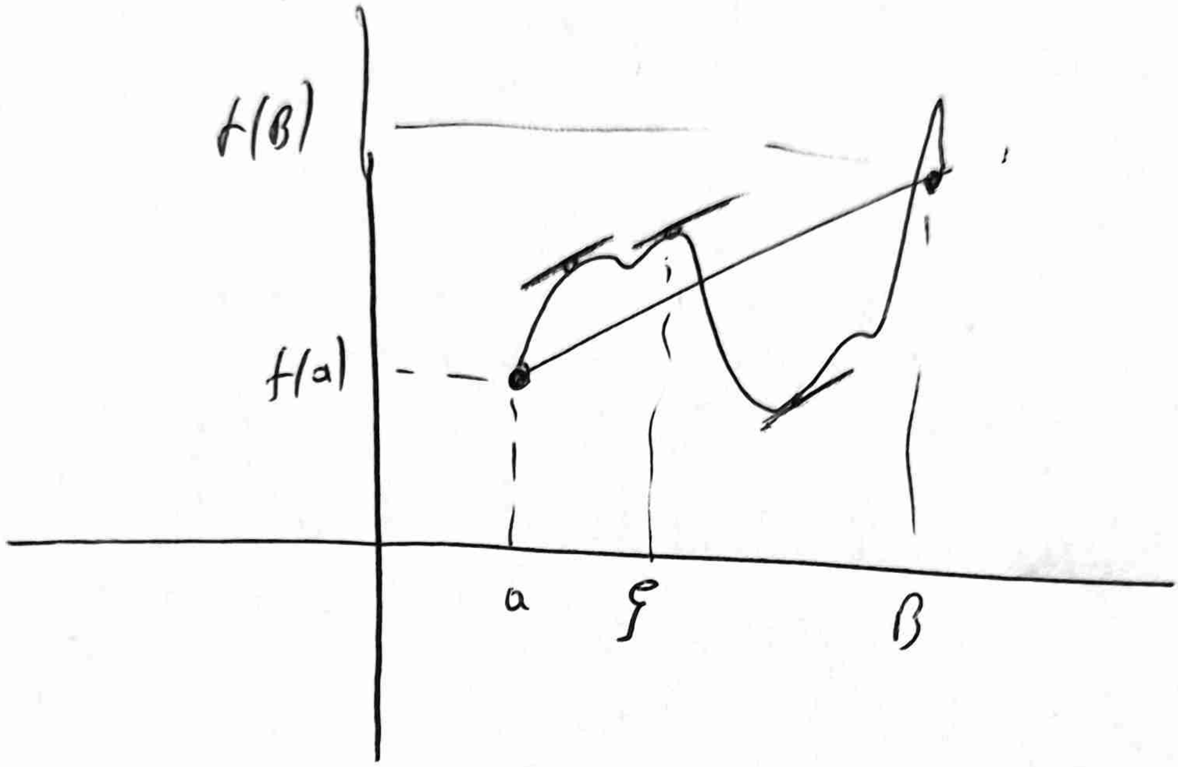
- Έστω f συνεχής $[\alpha, \beta]$
- και f παρ/μη (α, β)
- $f(\alpha) = f(\beta)$

$\exists\, \xi \in (\alpha, \beta)$ τ.ω. $f'(\xi) = 0$.

Ενοτητα 21

Η κλιση της ε_{AB}

$$\lambda = \frac{f(\beta)-f(a)}{\beta - a}$$



f συνεχης $[a,\beta]$

f παρ/μη (a,β)

$\exists\ \xi \in (a,\beta)$ τ.ω $f'(\xi) = \dfrac{f(\beta)-f(a)}{\beta - a}$.

Επομενο Μαθημα

24

Τεταρτη
10:30 - 1

31

35

36

38

39

41

43