

② $f(x) = 3^{2x} - 4 \cdot 3^x + 3$ i) Να λύσεις $f(x) = 0$ ii) Να λύσεις $f(x) < 0$ iii) $f(1) = ?$

Λύση i) $3^{2x} - 4 \cdot 3^x + 3 = 0$ Θέτω $3^x = w$ άρα $w^2 - 4w + 3 = 0$ $\Delta = 16 - 12 = 4$.

$w_{1,2} = \frac{4 \pm 2}{2} \rightarrow \begin{matrix} 3 \\ 1 \end{matrix}$ άρα $\exists \theta \epsilon \tau w$ $\begin{matrix} 3^x = 3 \\ 1-1 \\ x=1 \end{matrix}$ ή $\begin{matrix} 3^x = 1 \\ 3^x = 3^0 \\ 1-1 \\ x=0. \end{matrix}$

ii) $3^{2x} - 4 \cdot 3^x + 3 < 0$ $\theta \epsilon \tau w$ $3^x = w \Rightarrow w^2 - 4w + 3 < 0 \Rightarrow w^2 - 4w + 3 = 0 \dots w_{1,2} \rightarrow 1, 3$

x	$-\infty$	1	3	$+\infty$
$w^2 - 4w + 3$	$+$	$-$	$+$	$+$

$w \in (1, 3) \Rightarrow 1 < w < 3 \Rightarrow \exists \theta \epsilon \tau w$ $1 < 3^x < 3$

$\Rightarrow 3^0 < 3^x < 3^1$ $1-1 \uparrow$

άρα $0 < x < 1$.

iii) $f(1) = 3^{2 \cdot 1} - 4 \cdot 3^1 + 3 = 9 - 12 + 3 = 0$.