Section 4.4 — Dr. BADDAWI

#10) $R(x) = y = \dfrac{2x+4}{x-1}$

1. Domain: $x-1 \neq 0 \Rightarrow x \neq 1$

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

2. $x=0 \Rightarrow y=-4$, $(0,-4)$

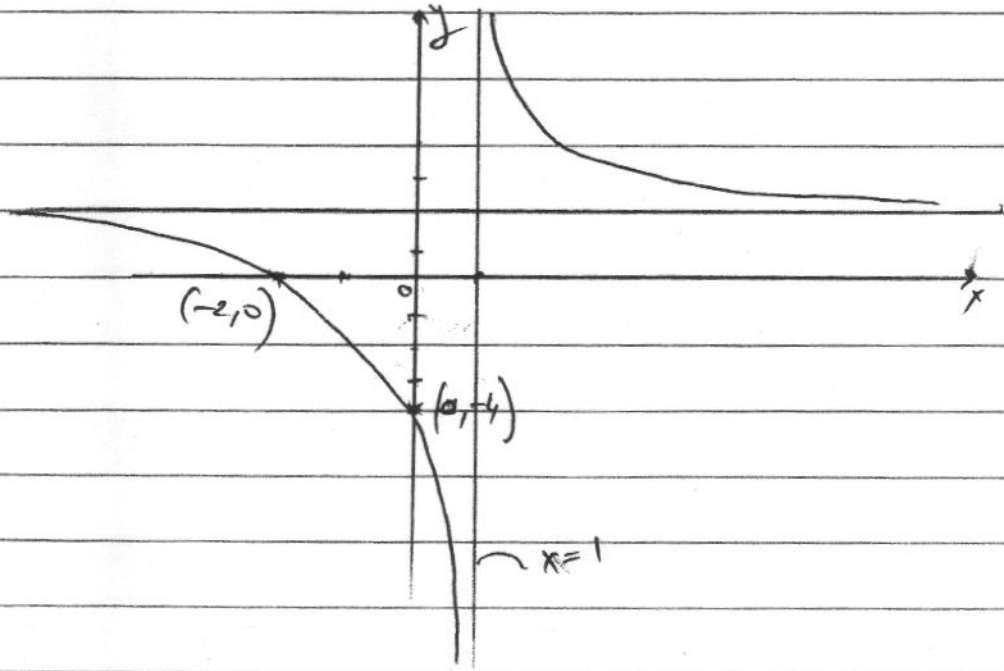
   $y=0 \Rightarrow 2x+4=0 \Rightarrow x=-2$, $(-2,0)$

3. As $x \to 1$, $y \to \pm\infty$; $x=1$ Asymptote

   As $x \to \pm\infty$, $y \to 2$; $y=2$ Asymptote

4. Critical Points are $x=-2, 1$

x	$-\infty$		-2		1		TA
$y=\frac{2x+4}{x-1}$		$+$	0	$-$	TA	$+$	



Άσκηση 4.4 (Να σχεδιαστεί)

α) $G(x) = y = \frac{3x}{x^2-1} = \frac{3x}{(x-1)(x+1)}$

1. Πεδίο ορισμού: $x^2-1 \neq 0 \rightarrow x \neq \pm 1$

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

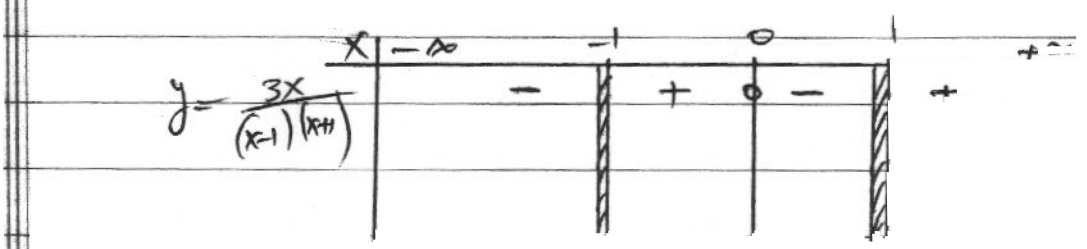
2. $x=0 \Rightarrow y=0$, $(0,0)$

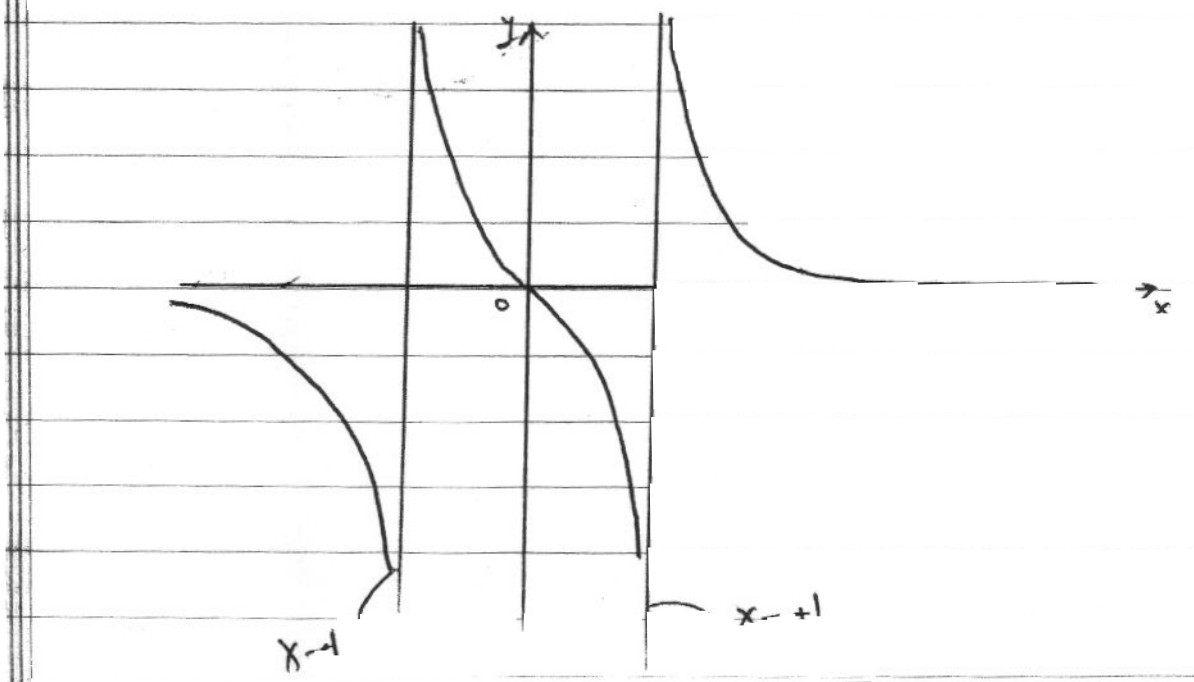
$y=0 \Rightarrow 3x=0 \rightarrow x=0$, $(0,0)$

3. Αν $x \rightarrow \pm 1$, $y \rightarrow \pm\infty$; $x=\pm 1$ Ασύμπτωτες

Αν $x \rightarrow +\infty$, $y \rightarrow 0$; $y=0$ Ασύμπτωτη

4. Διάστημα Ρίζες είναι: $x=0, \pm 1$





Section 4.4 — Dr. ABDALWI

#30) $y = G(x) = \dfrac{x^2-x-12}{x+1} = \dfrac{(x-4)(x+3)}{(x+1)}$

(1.) Domain $(x+1) \neq 0 \Rightarrow x \neq -1$

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

(2.) $x=0,\ y=-12$; $(0,-12)$

$y=0 \Rightarrow x^2-x-12=0$

$(x-4)(x+3)=0 \Rightarrow x=4,-3$; $(4,0),\ (-3,0)$

(3.) As $x \longrightarrow -1$, $y \longrightarrow \pm\infty$; $x=-1$ Asymptote

$$\begin{array}{r|l} x+1 & x^2-x-12 \\ & x^2+x \\ \hline & -2x-12 \\ & -2x-2 \\ \hline & -10 \end{array} \qquad x-2$$

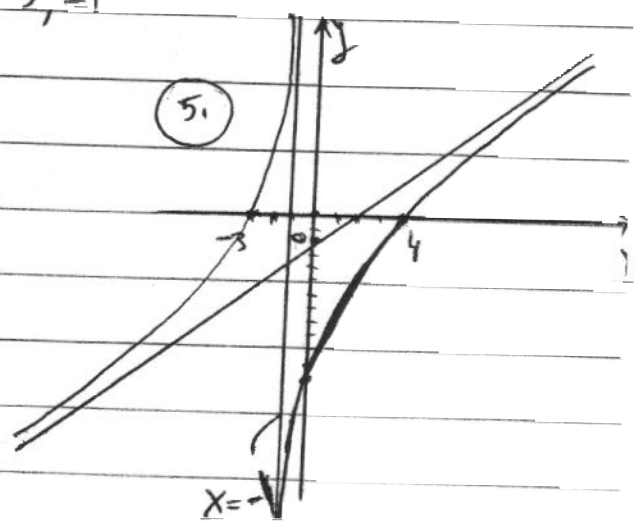
$$\Rightarrow y = \frac{x^2-x-12}{x+1} = (x-2) - \frac{10}{x+1}$$

As $x \longrightarrow \pm\infty$, $y \longrightarrow x-2$; $y=x-2$ Asymptote

(4.) Critical Points are : $x=4,-3,-1$

x	$-\infty$	-3	-1	4	$+\infty$
$y=\frac{x^2-x-12}{x+1}$	$-$	0 $+$	$+$	0 $+$	

(5.)



Section 4.4 — Dr. BARNAWI

#40 $R(x) = y = 2x + \frac{9}{x} = \frac{2x^2+9}{x}$

1. Domain : $x \neq 0 \rightarrow x \in (-\infty, 0) \cup (0, +\infty)$

2. $x \neq 0$
$y \neq 0$ because $2x^2+9 \neq 0$ (Summation of two squares is a prime)

3. As $x \rightarrow 0$, $y \rightarrow \pm\infty$; $x=0$ Asymptote
As $x \rightarrow \pm\infty$, $y \rightarrow 2x$; $y=2x$ Asymptote.

4. The only critical pt. here is $x = 0$

x	$-\infty$		0		$+\infty$
$y = \frac{2x^2+9}{x}$		$-$	‖	$+$	

5.