

DATE:

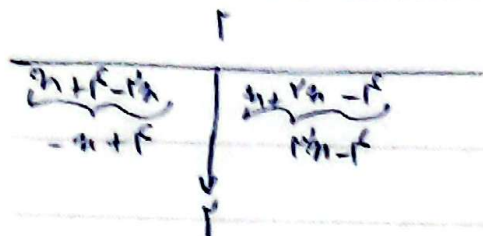
Giselle

SUB:

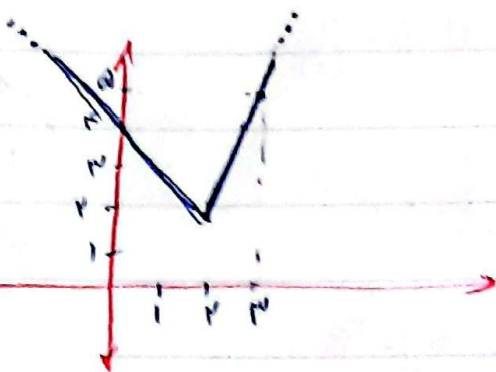
Laplace

1-

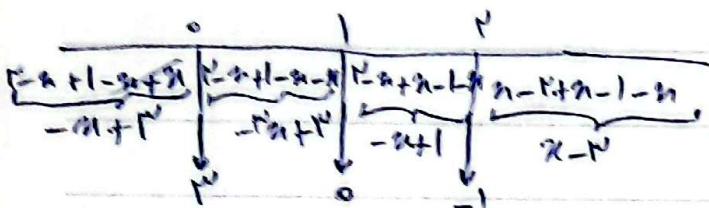
$$الف) y = x + |x - r|$$



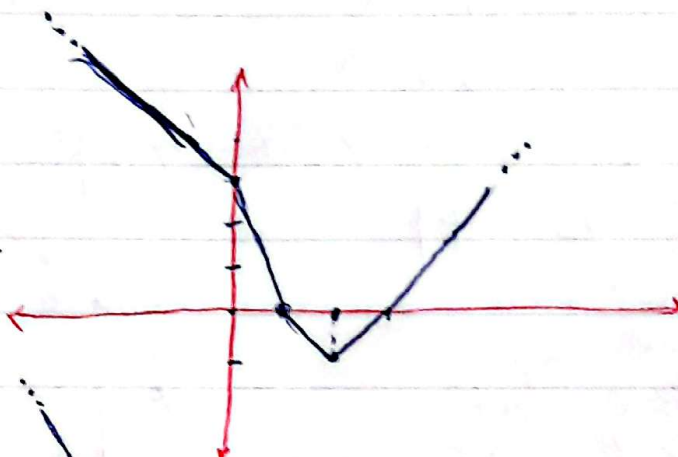
$$R_f = [r, +\infty)$$



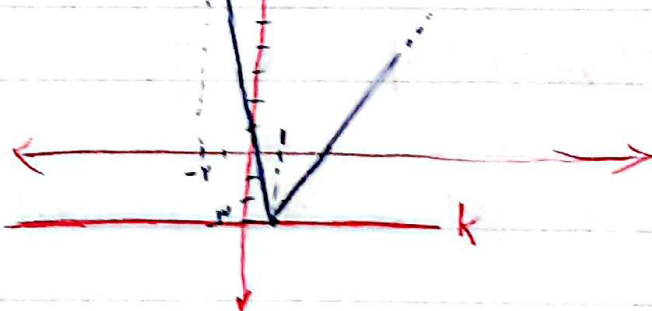
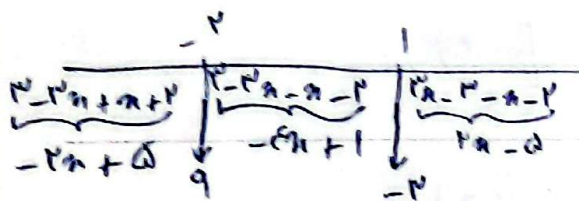
$$ب) y = |x - r| + |x - 1| - |x|$$



$$R_f = [-1, +\infty)$$

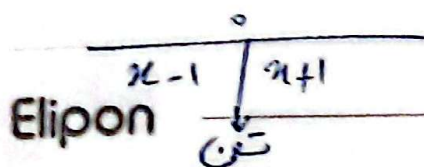
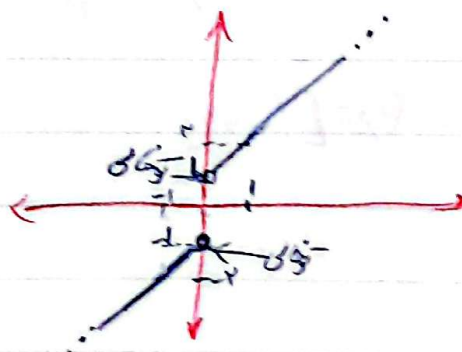


$$ج) |x - r| - |x + r| = k$$



$$\Rightarrow k = -2r$$

$$الف) y = x + \frac{x}{|x|}$$

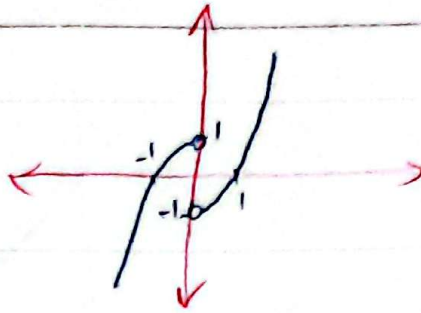


Elipon

تقن

$$b) y = x/|x| - \frac{x}{|x|}$$

$$\frac{-x^2+1}{x^2-1}$$



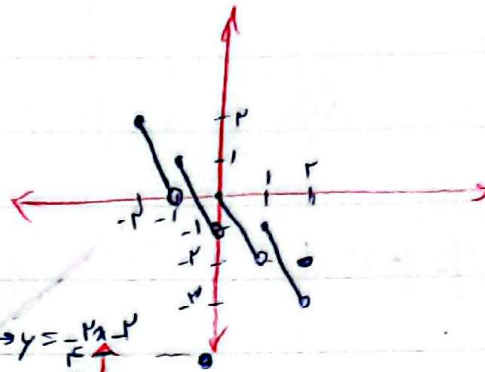
$$c-الف) y = [x] - x$$

$$x=2 \rightarrow y=-2$$

$$1 \leq x < 2 \rightarrow y = 1 - x$$

$$0 \leq x < 1 \rightarrow y = -x$$

$$-1 \leq x < 0 \rightarrow -x - 1 = y \quad x \leq -1 \rightarrow y = -x - 1$$



$$b) y = [x]|x|$$

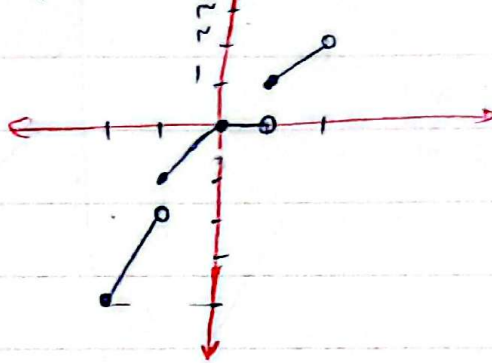
$$x=2 \rightarrow y=2$$

$$1 \leq x < 2 \rightarrow y=x$$

$$0 \leq x < 1 \rightarrow y=0$$

$$-1 \leq x < 0 \rightarrow y=x$$

$$x \leq -1 \rightarrow y=x$$



$$d-الف) y = x^n - [x^n] \rightarrow R_f = [0, 1)$$

$$b) y = f(x) - f([x]) \rightarrow f(\underbrace{x - [x]}_{[0, 1)}) \rightarrow R_f = [0, f)$$

$$c) y = x - a \left[\frac{x}{a} \right] \rightarrow a \left(\underbrace{\frac{x}{a} - \left[\frac{x}{a} \right]}_{[0, 1)} \right) \rightarrow R_f = [0, a)$$

$$d) y = [x] - x \rightarrow R_f = (-1, 0]$$

9-الف) $y = w \sin n + v \cos n \rightarrow R_f = [-\sqrt{w^2 + v^2}, \sqrt{w^2 + v^2}] \rightarrow R_f = [-\sqrt{w^2 + v^2}, \sqrt{w^2 + v^2}]$

ب) $y = v \sin n - w \cos n \rightarrow R_f = [-w, w]$

ج) $y = \frac{v \sin n + w \cos n}{\sqrt{w^2 + v^2}} \rightarrow R_f = \{-1, -\frac{w}{\sqrt{w^2 + v^2}}, -\frac{v}{\sqrt{w^2 + v^2}}, 0, \frac{v}{\sqrt{w^2 + v^2}}, \frac{w}{\sqrt{w^2 + v^2}}, 1\}$

د) $y = \frac{\cos n - v \sin n}{\sqrt{v^2 + 1}} \rightarrow R_f = [0, \sqrt{v^2 + 1}]$

هـ-الف) $y = \sin^2 n + w \sin n + v + \frac{1}{f} - \frac{1}{f} = \left(\sin n + \frac{w}{2} \right)^2 - \frac{w^2}{4} + \frac{1}{f} - \frac{1}{f} \rightarrow [0, \frac{w^2}{4} + \frac{1}{f} - \frac{1}{f}]$
 $\rightarrow R_f = [0, \frac{w^2}{4} + \frac{1}{f} - \frac{1}{f}]$

ب) $y = v \sin^2 n + w \sin n + v \begin{cases} \sin n = 1 \rightarrow v - w + v = 1 \\ \sin n = -1 \rightarrow v + w + v = v \\ -\frac{v}{f} = \sin n \rightarrow \frac{v}{f} - \frac{v}{f} + v = \frac{v}{f} \end{cases}$
 $\Rightarrow R_f = [\frac{v}{f}, v]$

ج-الف) $y = \frac{\sin^2 n}{1 - \cos^2 n} + f \cos^2 n = 1 + f \cos^2 n \rightarrow R_f = [1, 1+f]$

د) $y = \frac{v \cot n}{1 + \cot^2 n} = v \frac{\cos n}{\sin n} \times \sin^2 n = v \cos n \sin n = \sin 2n$

$\Rightarrow R_f = [-1, 1]$

9. الف) $y = \sin^n n + \cos^n n \rightarrow R_f = [r^{1-r}, 1] \rightarrow R_f = [\frac{1}{2}, 1]$

ب) $y = \underbrace{\sin^n n + \cos^n n}_{[r^{1-r}, 1]} \rightarrow R_f = \{0, 1\}$

10. الف) $y = \frac{r^n + \sqrt{n-r}}{n+r} = \frac{(n+r)(r-1)}{n+r} \rightarrow R_f = [R, \frac{1}{2} - 9]$

$r(-r) - 1 = (-9)$

ب) $y = \frac{n^r - 1}{n-1} = \frac{(n^r + n + 1)(n-1)}{(n-1)} \rightarrow R_f = [\frac{r}{2} + \infty)$

$n^r + n + 1 \rightarrow -\frac{1}{r} \rightarrow \frac{1}{r} - \frac{1}{r} + 1 = \left(\frac{r}{r}\right) \text{ Min}$

$n^r + n + 1 \xrightarrow{n=1} 1 + 1 + 1 = 3 \rightarrow \text{طرف دیگر ندارد}$