

Subject :

Year. Month. Date. ()

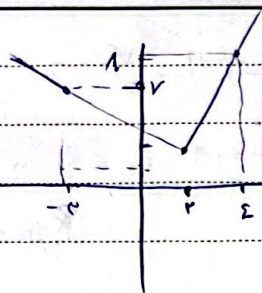
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دریا ریاضی در دسترس

$$a) y = x + |x - 2|$$

$$\begin{array}{c|c} x-2 & x+2 \\ \hline x-2 & x+2 \end{array}$$

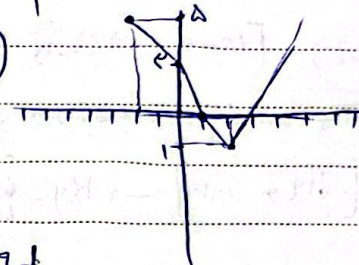
$$R_f = [2, +\infty)$$



$$b) y = |x-2| + |x-1| - |x|$$

$$\begin{array}{c|c|c} x-2 & x-1 & x \\ \hline -x+2 & -x+1 & -x \end{array}$$

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

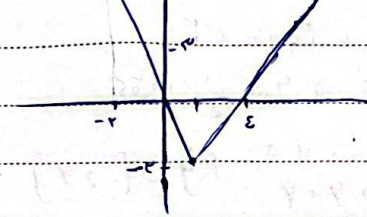


$$|x-2| - |x+2| = k$$

$$\begin{array}{c|c} x-2 & x+2 \\ \hline -x+2 & -x-2 \end{array}$$

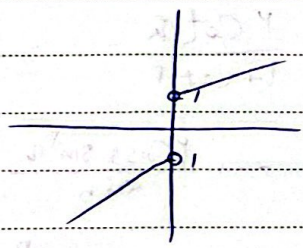
$$k = 1 \rightarrow x = 1$$

$$f(1) = |1-2| - |1+2| = 1 - 3 = -2 \rightarrow k = -2$$



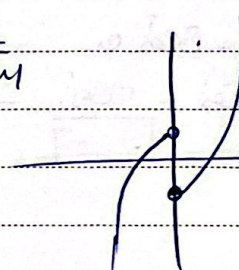
$$a) y = x + \frac{x}{|x|}$$

$$\begin{array}{c|c} x-1 & x+1 \\ \hline x-1 & x+1 \end{array}$$



$$c) y = x|x| - \frac{x}{|x|}$$

$$\begin{array}{c|c} x^2+1 & x^2-1 \\ \hline x^2+1 & x^2-1 \end{array}$$



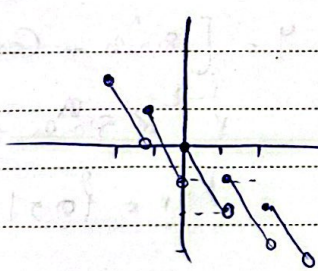
$$a) y = [x] - x$$

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

$$1 < x < 2 \rightarrow 1 - x$$

$$-1 < x < 1 \rightarrow -x$$

$$-1 < x < 0 \rightarrow -x - 1$$



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

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

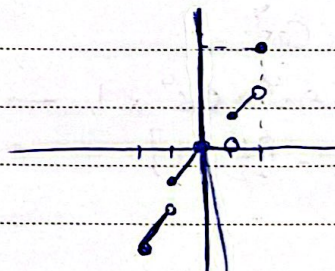
$$x=1 \rightarrow y = 1$$

$$1 < x < 2 \rightarrow x$$

$$-1 < x < 1 \rightarrow 0$$

$$-1 < x < 0 \rightarrow -|x|$$

$$-2 < x < -1 \rightarrow -2|x|$$



$$a) y = x - [x]$$

$$R_y = [0, 1)$$



$$b) y = x - f([x])$$

$$x(x - [x]) \rightarrow R_y = [0, 1)$$

$$c) y = x - \Delta\left(\frac{x}{\Delta}\right)$$

$$\Delta\left(\frac{x}{\Delta}\right) - \Delta\left[\frac{x}{\Delta}\right] \rightarrow \Delta\left(\frac{x}{\Delta} - \left[\frac{x}{\Delta}\right]\right)$$

$$R_y = [0, \Delta)$$

$$d) y = [x] - x$$

$$R_y = [-1, 0]$$

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$$a) y = \sqrt{r} \sin n + \sqrt{r} \cos n$$

$$-\sqrt{r+9} \leq \sqrt{r} \sin n - \sqrt{r} \cos n \leq \sqrt{r+9}$$

$$Ry_1 = [-\sqrt{r}, \sqrt{r}]$$

$$b) y = \sqrt{r} \sin n - \sqrt{r} \cos n$$

$$-\sqrt{r+9} \leq \sqrt{r} \sin n - \sqrt{r} \cos n \leq \sqrt{r+9}$$

$$Ry_1 = [-\sqrt{r}, \sqrt{r}]$$

$$c) y = [\sqrt{r} \sin n + \sqrt{r} \cos n]$$

$$-\sqrt{r+9} \leq \sqrt{r} \sin n + \sqrt{r} \cos n \leq \sqrt{r+9}$$

$$[-\sqrt{r+9}, \sqrt{r+9}] \rightarrow Ry = \{y | y \in \mathbb{Z}, -4 \leq y \leq 4\}$$

$$d) y = \sqrt{r} \cos n - \sqrt{r} \sin n$$

$$-\sqrt{r+9} \leq \sqrt{r} \cos n - \sqrt{r} \sin n \leq \sqrt{r+9}$$

$$[-\sqrt{r+9}, \sqrt{r+9}] \rightarrow Ry_2 = [-\sqrt{r+9}, \sqrt{r+9}]$$

$$y = \sqrt{r} \sin n + \sqrt{r} \cos n + r$$

$$-\frac{b}{r} \leq \frac{-r}{r} \Rightarrow y = -\frac{1}{r} \text{ to } \frac{1}{r}$$

$$n = -1 \rightarrow y = -\frac{1}{r}$$

$$n = 1 \rightarrow y = \frac{1}{r}$$

$$Ry_1 = [-\frac{1}{r}, \frac{1}{r}]$$

$$y = \sqrt{r} \sin n + \sqrt{r} \cos n + r$$

$$-\frac{b}{r} \leq \frac{-r}{r} \Rightarrow y = -\frac{1}{r} \text{ to } \frac{1}{r}$$

$$n = -1 \rightarrow y = -\frac{1}{r}$$

$$n = 1 \rightarrow y = \frac{1}{r}$$

$$Ry = [-\frac{1}{r}, \frac{1}{r}]$$

$$y = \sqrt{r} \sin n + \sqrt{r} \cos n$$

$$\sqrt{r} \sin n + \sqrt{r} \cos n \rightarrow Ry_1 = [-\sqrt{r}, \sqrt{r}]$$

$$c) y = \frac{r \cot n}{1 + \cot^2 n}$$

$$\frac{r \cot n}{\frac{1}{\sin^2 n}} \rightarrow \frac{r \cos n \sin^2 n}{\sin n} = r \cos n \sin n$$

$$Ry_1 = [-r, r]$$

$$y = \sqrt{r} \sin^2 n + \sqrt{r} \cos^2 n$$

$$\sqrt{r} \sin^2 n + \sqrt{r} \cos^2 n \rightarrow \frac{1}{2} \sqrt{r} \sin^2 n + \frac{1}{2} \sqrt{r} \cos^2 n$$

$$Ry_1 = [\frac{1}{2} \sqrt{r}, \sqrt{r}]$$

$$y = [\sqrt{r} \sin^2 n + \sqrt{r} \cos^2 n]$$

$$\sqrt{r} \sin^2 n + \sqrt{r} \cos^2 n \rightarrow \frac{1}{2} \sqrt{r} \sin^2 n + \frac{1}{2} \sqrt{r} \cos^2 n$$

$$Ry_1 = \{0, 1\} \rightarrow \text{محدود}$$

$$y = \frac{r a^n + r n - r}{n + r}$$

$$\frac{(n+r)(r-1)}{n+r}$$

$$n \neq -r \rightarrow y \neq -1$$

$$Ry = \mathbb{R} - \{-1\}$$

$$y = \frac{a^n - 1}{a - 1}$$

$$\frac{(a-1)(a^n + 1 + a^{n-1} + \dots + a + 1)}{a-1} = a^n + a^{n-1} + \dots + a + 1$$

$$a \neq 1 \rightarrow y \neq r$$

$$Ry_1 = [\frac{r}{2}, +\infty)$$

