

وبیانا میدیور - کلیف شماره شصت و چهار - دوازدهم ذی قعدة ۱۳۹۵

سوال یک) الف) $f(x) = 2 \sin^2(x + \frac{\pi}{4}) - 1 \Rightarrow f(x') = 2 \sin^2(x') - 1$
 $-1 \leq \sin(x') \leq 1 \Rightarrow 0 \leq \sin^2(x') \leq 1 \Rightarrow 0 \leq 2 \sin^2(x') \leq 2$
 $\Rightarrow -1 \leq 2 \sin^2(x') - 1 \leq 1 \Rightarrow R_f = [-1, 1]$ جواب

ب) $g(x) = 3 \cos^2 x - 4$ $-1 \leq \cos x \leq 1 \Rightarrow 0 \leq \cos^2 x \leq 1 \Rightarrow 0 \leq 3 \cos^2 x \leq 3$
 $\Rightarrow -4 \leq 3 \cos^2 x - 4 \leq -1 \Rightarrow R_g = [-4, -1]$ جواب

سوال دو) $y = \frac{x}{|x|} + [x] \quad [-3, 3] \Rightarrow x \neq 0 \quad \frac{x}{|x|} = \begin{cases} 1 & x \geq 0 \\ -1 & x < 0 \end{cases}$

$-3 \leq x < -2 \quad [x] = -3 \Rightarrow y = -1 - 3 = -4$

$-2 \leq x < -1 \quad [x] = -2 \Rightarrow y = -1 - 2 = -3$

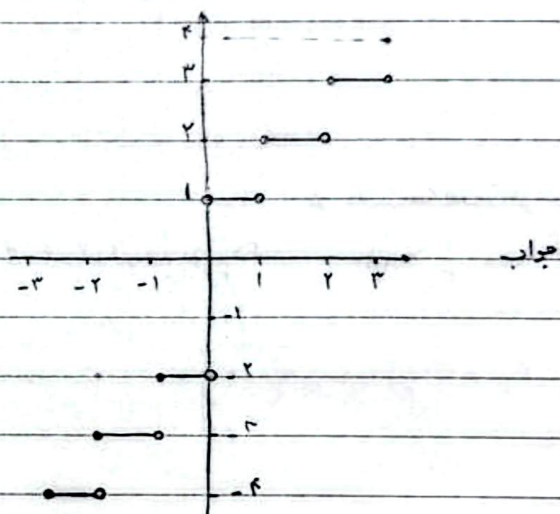
$-1 \leq x < 0 \quad [x] = -1 \Rightarrow y = -1 - 1 = -2$

$0 \leq x < 1 \quad [x] = 0 \Rightarrow y = 1$

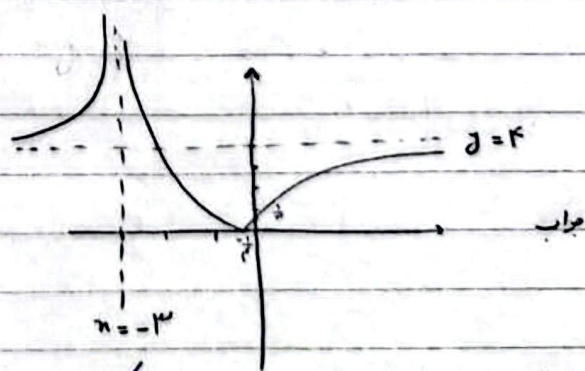
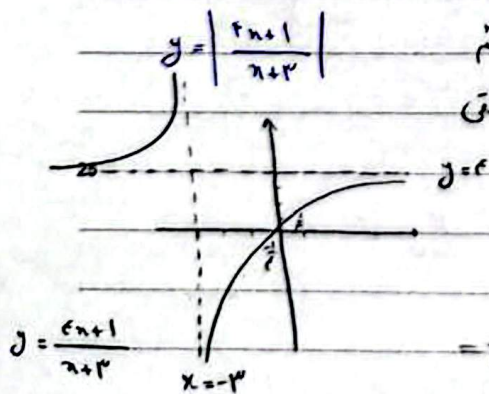
$1 \leq x < 2 \quad [x] = 1 \Rightarrow y = 1 + 1 = 2$

$2 \leq x < 3 \quad [x] = 2 \Rightarrow y = 1 + 2 = 3$

$x = 3 \quad [x] = 3 \Rightarrow y = 1 + 3 = 4$



سوال سه) $y = \left| \frac{x+1}{x+3} \right|$ $x+3=0 \Rightarrow x=-3$ $x=1 \Rightarrow y = \frac{2}{4} = \frac{1}{2}$
 $x+3=0 \Rightarrow y = \frac{4}{4} = 1$
 $y = \left| \frac{x+1}{x+3} \right|$



$y = 0 \Rightarrow x = -\frac{1}{3}$

$x = 0 \Rightarrow y = \frac{1}{3}$

لکه هر چه از محور ها است را به بالا قرار می کنیم

سوال چهار (۳ نصف قطر | ۱ | ۳ ربع)

$$|x-2| + |y-1| = 3$$

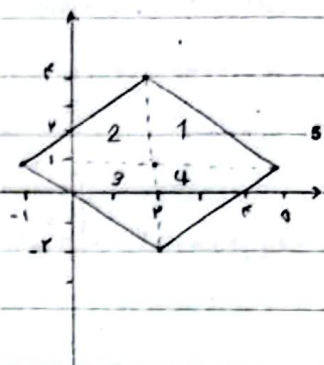
نقطه مربع

1. ناحیه اول $x \geq 2, y \geq 1 \Rightarrow x-2+y-1=3 \Rightarrow y=4-x$

2. ناحیه دوم $x < 2, y \geq 1 \Rightarrow -x+2+y-1=3 \Rightarrow y=x+2 \quad (0,2)$

3. ناحیه سوم $x < 2, y < 1 \Rightarrow -x+2-y+1=3 \Rightarrow y=-x \quad (0,0)$

4. ناحیه چهارم $x \geq 2, y < 1 \Rightarrow x-2-y+1=3 \Rightarrow y=x-4 \quad (2,0)$



10 سوال پنج (الف) $f(x) = x + \frac{1}{x} + 2\sqrt{x + \frac{1}{x}}$

$[2, +\infty) \xrightarrow{a>0} x + \frac{1}{x}$

$[2, +\infty) \xrightarrow{a>0} [2\sqrt{2}, +\infty)$

$R_f = [2\sqrt{2}, +\infty)$ جواب

$f(x) = \left(\sqrt{x + \frac{1}{x}}\right)^2 + 2\sqrt{x + \frac{1}{x}} \Rightarrow \sqrt{x + \frac{1}{x}} \xrightarrow{a>0} \sqrt{2} \Rightarrow \frac{-b}{2a} = -1 \times$

$2\sqrt{2} = 2\sqrt{2} = [2\sqrt{2}, +\infty)$

★ قسمت ب منفرجه سيفيد با اناليم:

15 سوال شش $f(x) = -\frac{1}{x}x + 10 \quad D_f = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$

$R_f = \left\{ -\frac{1}{1} \times 1 + 10, -\frac{1}{2} \times 2 + 10, -\frac{1}{3} \times 3 + 10, \dots, -\frac{1}{9} \times 9 + 10 \right\} \Rightarrow -\frac{1}{9} (1+2+\dots+9) + 9 \times 10 = 90 - 5 = 85 = \sqrt{4}$

جواب

20 سوال هفت $f(x) = \sqrt{ax^2 + bx + c} \quad D_f = [2, +\infty), f(2) = 1$

$g(x) = \sqrt{bx^2 + ax + c} \quad R_g = ? \quad ax^2 + bx + c \geq 0 \xrightarrow{a>0} [2, +\infty)$

$\Rightarrow a=0, f(x)=0$ فاصله

$\begin{cases} 2b+c=0 \\ 2b+c=1 \end{cases} \Rightarrow b=1, c=-2$

25 $g(x) = \sqrt{x^2 + 2} \quad \text{منه} \Rightarrow \min \Rightarrow \text{نقطه} \Rightarrow R = [2, +\infty)$

$\Rightarrow \sqrt{2} = \Rightarrow R_g = [2, +\infty)$ جواب

$$f\left(\frac{a+b}{rc}\right) = ? \Rightarrow f\left(\frac{-r+r}{rc-1}\right) = f(-1) = (-1)^r - rc - 1 = \boxed{r}$$

$$D_f = 1R - \left\{ \begin{matrix} \text{مقدار} \\ \lambda + r = 0 \Rightarrow \lambda = -r \end{matrix} \right\} = 1R - \{-r\} \quad f(n) = n^r - rn \xrightarrow{\text{مقدار min}} \text{إلى} \left| \begin{matrix} -\frac{b}{2a} = \frac{r}{r} = 1 \\ 1 - r = -1 \end{matrix} \right|$$

$\Rightarrow x^2 - 2x = 0 \Rightarrow x^2 - 2x - 0 = 0 \Rightarrow K_p = [-1, +\infty) \quad \boxed{c = -1}$
 $\Rightarrow (x - f)(x + r) = 0 \quad \left. \begin{array}{l} x = -r = a \\ x = f = b \end{array} \right\} \quad \begin{array}{l} b = r \\ a = f \end{array}$

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 $y = \sqrt{x^2 + ax^r + bx - 1}$ $D_y = [a, b]$ $R_y = ? \Rightarrow R_y = [-1, 1]$ (سوال نه)
 جواب

چون م نام فعلی است یعنی توان زیرادیکال با فرم ساده شده است

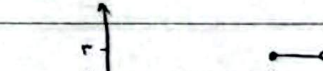
$y = \sqrt{(x-2)^2} = \sqrt{x^2 - 4x + 4} = x - 2$
 $\hookrightarrow a = -4, b = 12$ $D_y = [-4, 12]$ $x = -4 \Rightarrow y = -6$
 $x = 12 \Rightarrow y = 10$

مسئله (د) ۳ باره خط $c =$ جواب $y = [x] + \left[n + \frac{1}{r}\right] \left[\frac{1}{r}, 2\right)$

20 $1 \rightarrow \frac{1}{r} \leq n < 1 \rightarrow 1 \leq n + \frac{1}{r} \leq \frac{r}{r} \xrightarrow{\substack{[n] = 0 \\ [n + \frac{1}{r}] = 1}} 0 + 1 = 1$

$1 \leq n < \frac{r}{r} \rightarrow \frac{r}{r} \leq n + \frac{1}{r} < r \xrightarrow{\substack{[n] = 1 \\ [n + \frac{1}{r}] = 1}} 1 + 1 = r$

$\frac{r}{r} \leq n < r \rightarrow r \leq n + \frac{1}{r} < \frac{r}{r} \xrightarrow{\substack{[n] = 1 \\ [n + \frac{1}{r}] = r}} 1 + r = r$



ج) $(3 - \sin n)(1 + \sin n)$ ★ سوال پنج - بیضی با ابعاد ۵

$$\hookrightarrow 3 + 3\sin n + \sin n - \sin^2 n = -\sin^2 n + 3\sin n + 3 \xrightarrow{-1} 0$$

$$\begin{bmatrix} 1 \\ 1 \end{bmatrix} \cdot 2 \Rightarrow R_2 = [0 \ 2] \text{ جواب}$$

$$\begin{bmatrix} 1 \\ -\frac{b}{a} = \frac{-2}{-1} = 2 \end{bmatrix} \Rightarrow 2$$

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