

۱۹، ۷۵ آفرین!

طالع ریحان - دوازدهم رجب

$$f(x+1) + f(x+2) = 3x + f(x)$$

سوال ۱

گزینه ۱
 $y = ax + b$ → فرض کنیم خطی است

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$$a(x+1) + b + a(x+2) + b = 3x + a(x) + b$$

$$2ax + a + b + ax + 2a + b = 3x + 3a + b$$

$$3ax + \cancel{a} + 2b = 3x + \cancel{3a} + b \rightarrow 3ax + 2b = 3x + b$$

$$3ax = 3x \rightarrow a = 1$$

$$b = 0$$

$$y = x$$

$$y = \sqrt{f(x) - x^2} \rightarrow y = \sqrt{x - x^2} \rightarrow x_s = -\frac{b}{2a} = -\frac{1}{-2} = \frac{1}{2}$$

$$y_s = \sqrt{\frac{1}{2} - \frac{1}{4}} = \sqrt{\frac{1}{4}} = \frac{1}{2}$$

$$R_f = \left[0, \frac{1}{2}\right]$$

بازه مقبول، (مطلوب)

$$y = \frac{x^2 - 4x}{x+2} \rightarrow y = \frac{x(x-4)}{x+2} \rightarrow y = \frac{x(x-2)(x+2)}{x+2}$$

سوال ۲

$$y = x(x-2) \rightarrow [(-\infty, -1) \cup (1, \infty)]$$

۳

$$x(x-2) = 1 \rightarrow x^2 - 2x = 1 \rightarrow x^2 - 2x - 1 = 0 \rightarrow (x-1)^2 - 2 = 0$$

$$x^2 - 2x - 1 = 0 \rightarrow a_1b = -2, c = -1 \rightarrow a = -2, b = 1$$

$$y = x^2 - 2x \rightarrow x_s = -\frac{b}{2a} = \frac{1}{-2} = -\frac{1}{2}$$

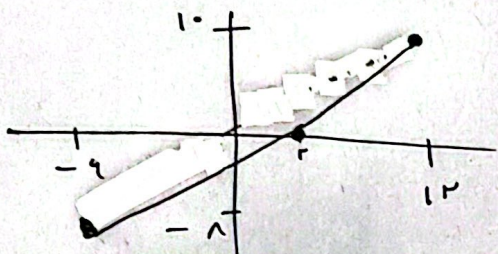
$$y_s = 1 - 2 = -1 \rightarrow C = -1$$

$$f\left(\frac{a+b}{2c}\right) \rightarrow f\left(\frac{-2+1}{-2}\right) \rightarrow f\left(\frac{1}{2}\right) = f(-1) \rightarrow (-1)^2 - 2(-1) = 3$$

②

$a = -9$
 $b = 15$

$$K_f = [-\Lambda q | 0]$$



2

$R_{y_r} = (-\frac{1}{b}, a)$ $\Theta_f = [-\ln 1]$

$$R_{y_r} = \begin{pmatrix} -\frac{1}{b} & a \end{pmatrix} \quad \Theta_{f_1} = [-1 \ 1]$$

$$L \rightarrow -\frac{1}{b} = -1 \quad (b=1)$$

$L \rightarrow a = 1$

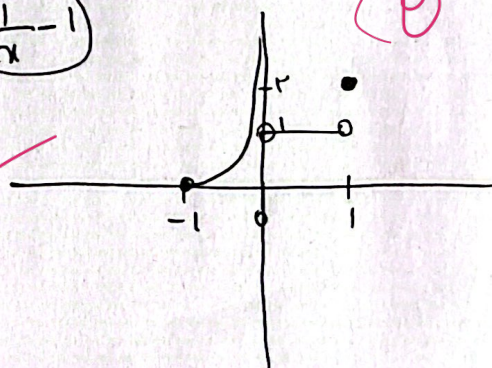
$$a + b = 1 + 1 = 2$$

④

$$\frac{-1}{x} - 1$$

⑤

②



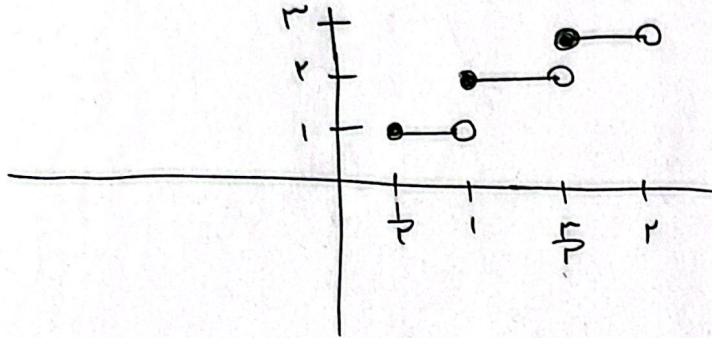
$$y = \lceil x \rceil + \lceil x + \frac{1}{2} \rceil$$

✓ سوال 4

$$\frac{1}{2} \leq x < 1 \rightarrow \lceil x \rceil = 1 \rightarrow 1 \leq x + \frac{1}{2} < \frac{3}{2} \rightarrow \lceil x + \frac{1}{2} \rceil = 1 \rightarrow y = 2$$

$$1 \leq x < \frac{3}{2} \rightarrow \lceil x \rceil = 1 \rightarrow \frac{3}{2} \leq x + \frac{1}{2} < 2 \rightarrow \lceil x + \frac{1}{2} \rceil = 2 \rightarrow y = 3$$

$$\frac{3}{2} \leq x < 2 \rightarrow \lceil x \rceil = 2 \rightarrow 2 \leq x + \frac{1}{2} < \frac{5}{2} \rightarrow \lceil x + \frac{1}{2} \rceil = 3 \rightarrow y = 5$$



$$\left| \frac{x+1}{ax+r} \right| < 1 \rightarrow \frac{|x+1|}{|ax+r|} < 1 \rightarrow |x+1| < |ax+r| \quad (\text{✓ سوال 1, 20})$$

$$\xrightarrow{\text{مربع}} (x+1)^2 < (ax+r)^2 \rightarrow x^2 + 2x + 1 < a^2x^2 + 2arx + r^2$$

$$x^2 - a^2x^2 + 2x - 2arx + 1 - r^2 < 0$$

$$(1-a^2)x^2 + (2-2a)r x - (r^2 - 1) < 0 \rightarrow ((1-a)x - r)((1+a)x + r) < 0$$

$$\text{اگر } a \neq \pm 1 \text{، دو ریشه یابی می‌کنیم: } x = \frac{r}{1-a} \quad x = -\frac{r}{1+a}$$

$$\text{اگر } a = 1 \rightarrow (1-a)x - r = -r \rightarrow -r < 0 \rightarrow \text{ممنوع است.} \quad (1+a)x + r = 2x + r$$

$$a+b \rightarrow 1 + (-2) = -1 \quad (b+5) = (-2+5) \rightarrow b = -2$$

$$a-b = 1 - (-2) = 3 \quad \text{دست‌ن$$

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

$$x=2$$

$$y=1$$

و-2 و y + سيد قدر مطلق لول قدر 3
او صا صرصة يارب لن

من y و 2 + لن قدر مطلق صا

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

$$y=2-x$$

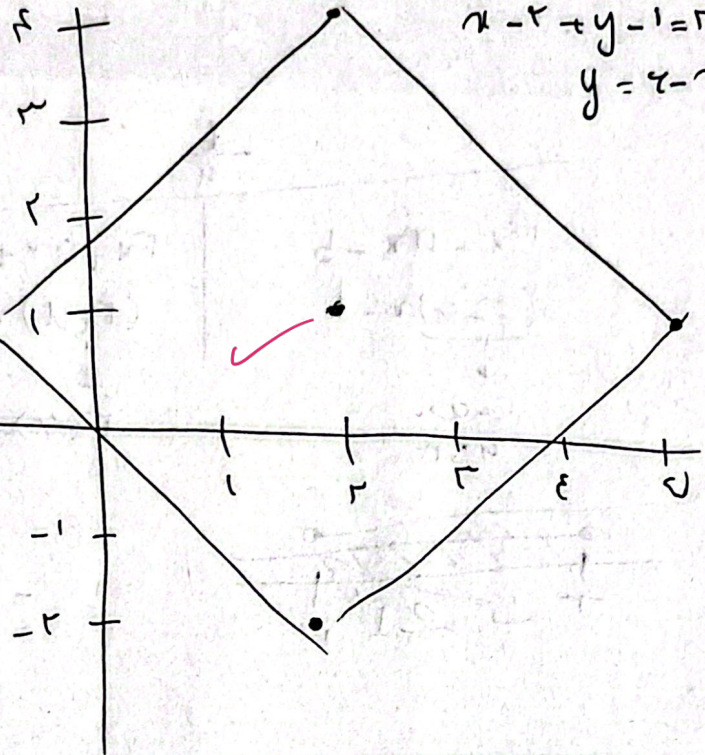
$$-x+2+y-1=3$$

$$y=x+2$$

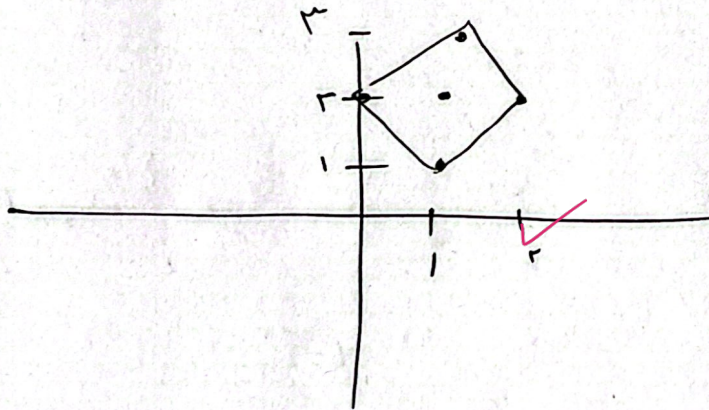
صرو قدر مطلق - صا
من صا صر صا - لن

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

$$y=-x$$

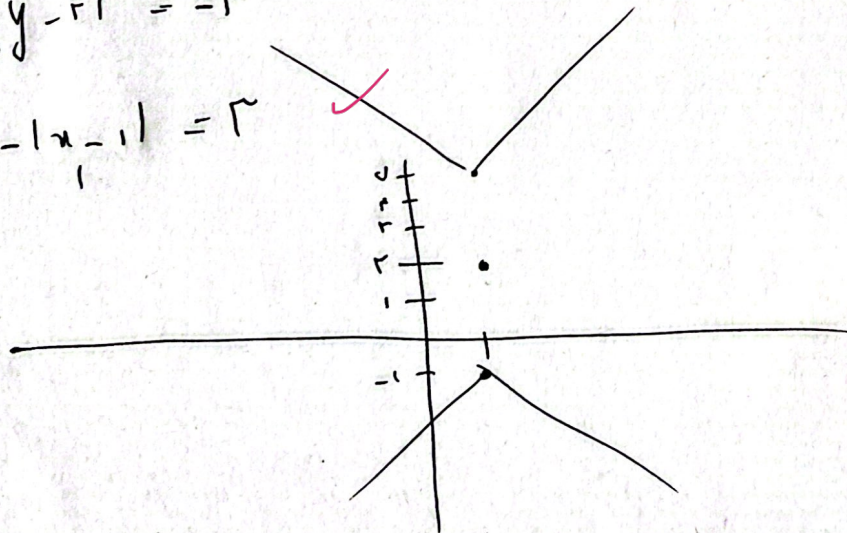


$$|x-1| + |y-2| = 1$$



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

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



$$y = rx + |ax + b|$$

$$x = -\frac{b}{a}$$

(سوال ۱۰)

۲

$$-\frac{b}{a}$$

$$rx - ax - b$$

$$(r-a)x - b$$

$$r-a$$

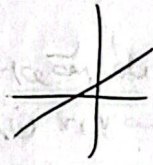
$$a < r$$

$$rx + ax + b$$

$$(r+a)x + b$$

$$r+a > -r$$

اگر بفرضیم برنایب r و a
 با r نشی هر دو طرف ریشه
 هر صطلح + و r که بکل
 زیر در اید



$$-r < a < r$$

