

$\rightarrow$ max $\sin \alpha = 1$ $y = 1 \Rightarrow$
 $\rightarrow \frac{b}{\sqrt{a}}$ $\sin \alpha = 0$ $x = 1 \Rightarrow$
 $\rightarrow$ min $\sin \alpha = -1$ $y = -1 \Rightarrow$

②

$\rightarrow \text{max } \cos \theta = 1 \quad \psi = t = -1$
 $\rightarrow \text{min } \cos \theta = -1 \quad \psi = t = -\psi$

1



2



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A hand-drawn graph of the absolute value function $y = |x|$ on a Cartesian coordinate system. The graph is a V-shape opening upwards with its vertex at the origin (0,0). The right branch of the V is labeled with the point (1,1), and the left branch is labeled with the point (-1,-1).

①

$$f(x) = \begin{cases} |y| = x + 1 & -1 \leq x \leq 1 \\ |y| = -x + 1 & x \leq -1 \text{ or } x \geq 1 \end{cases}$$

$$f(x) = \begin{cases} 1/x & x > 0 \\ |y| = -x + \omega & x \leq \omega \end{cases}$$

٣

$\rightarrow \max \sqrt{y + \frac{1}{y}} \rightarrow +\infty \quad f \rightarrow +\infty$
 $\rightarrow -\frac{b}{y_a} = -\frac{r}{r} = -100\%$
 $\rightarrow \min \sqrt{x - \frac{1}{x}} = \sqrt{r} \quad f = r + r$

2

$\rightarrow \max \quad \sin \alpha = 1 \quad -1 \leq \sin \alpha \leq 1$
 $\rightarrow -\frac{b}{a} \quad \frac{-y}{x} = 1 \quad -1 \leq \frac{-y}{x} \leq 1$
 $\rightarrow \min \quad \sin \alpha = -1 \quad -1 = -\frac{y}{x} \Rightarrow y = x$

2

رنگه

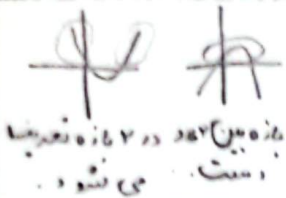
$$-\frac{1}{3} (1+2+\dots+9) + 9 + 10 = -15 + 19 = 4 \quad \boxed{V5}$$

$$D_f = \{1, 2, \dots, 9\} \rightarrow R_f = \left\{ \frac{r_1}{r}, \frac{r_2}{r}, \dots, \frac{r_9}{r} \right\}$$

$$y = -\frac{1}{3}x + 10$$

دنباله حسابی

$$S_n = \frac{n}{r} (a_1 + a_n) \Rightarrow S_n = \frac{9}{r} \left(\frac{r_1}{r} + \frac{r_9}{r} \right) \quad \boxed{V5}$$



تابع خطی است
 $a = 0$



$$\begin{cases} 2b + c = 0 \Rightarrow b = 1 \\ 3b + c = 1 \quad c = -2 \end{cases}$$

$$g(x) = \sqrt{x^2 + 1}$$

$$x^2 + 1 \leq \begin{cases} \max \\ \min \end{cases} \begin{cases} 100 \\ 0 \end{cases} \Rightarrow R_y = [1, +\infty)$$

$$a = b = 2$$

تابع تنها در $x = -2$ تعریف نمی شود پس:

$$\frac{x^3 - 2x}{x+2} \xrightarrow{x \neq -2} x^2 - 2x \left\{ \begin{array}{l} \max \\ \min \end{array} \begin{array}{l} +\infty \\ x=0 \end{array} \right\} \Rightarrow C = -1$$

$$\frac{a+b}{2c} = \frac{-2-2}{-2} = 2 \quad f(2) = \frac{A-A}{2} \quad \boxed{V5}$$

صفحه آخر...

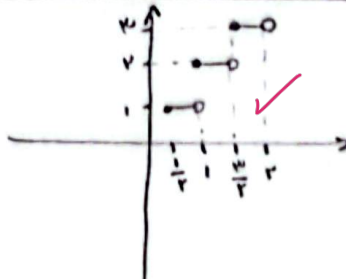
$$(x+c)^3 = x^3 + 3cx^2 + 3c^2x + c^3 = x^3 + ax^2 + bx + A$$

$$\Rightarrow c^3 = A \quad c^2 = 1 \quad c = -1 \Rightarrow a = c = -1 \quad b = c^2 = 1$$

$$y = x - 2 \quad [-2, +\infty) \quad R = [-2, +\infty)$$

صفحه آخر...

$$\begin{aligned} \frac{1}{2} \leq x < 1 &\rightarrow y = 0 + 1 = 1 \\ 1 \leq x < \frac{3}{2} &\rightarrow y = 1 + 1 = 2 \\ \frac{3}{2} \leq x < 2 &\rightarrow y = 1 + 2 = 3 \end{aligned}$$



سه پاره خط

1, V5

6

2

7

1, V5

8

1, V5

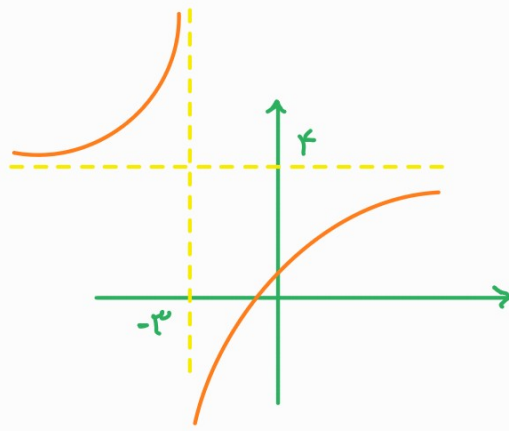
9

1, V5

10

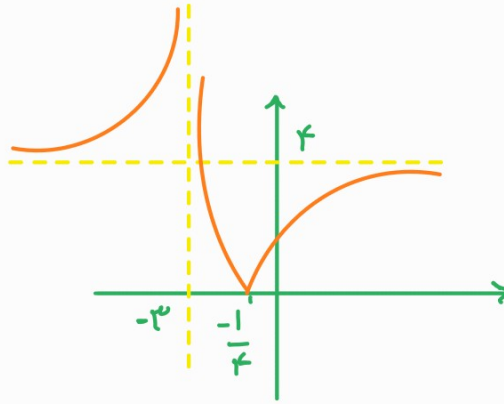
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$$y = \frac{x+1}{x+2}$$



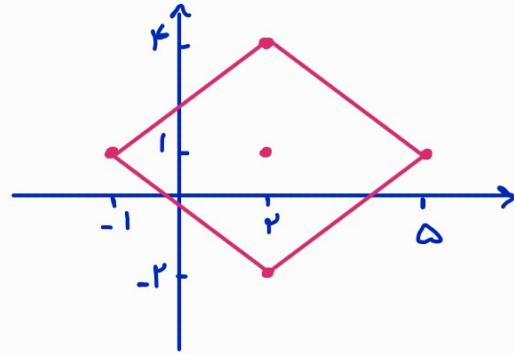
قدر مطلق دور خط، مقعر ها رو پاد میانه قریه
میانه بالات

$$y = \left| \frac{x+1}{x+2} \right|$$



-۴

$$\begin{cases} x > 2, y > 1 \rightarrow y = -x + 4 \\ x > 2, y \leq 1 \rightarrow y = x - 4 \\ x \leq 2, y > 1 \rightarrow y = x + 2 \\ x \leq 2, y \leq 1 \rightarrow y = -x \end{cases}$$



-۸

$$f(x) = \frac{x(x-2)(x+2)}{x+2} = x^2 - 2x$$

$$x^2 - 2x \neq 8 \rightarrow \begin{cases} x \neq -2 \\ x \neq 4 \end{cases}$$

$y = 8$ در برد تابع نیست یعنی:

پس دامنه بگیر است با: $D_f = \mathbb{R} - \{-2, 4\}$

حالا بییم سراغ برد نا: $f(x) = x^2 - 2x \rightarrow \text{ext} \Big|_{-1}^1 \Rightarrow R_f = [-1, +\infty) - \{8\}$

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

9. چون عدد ثابت عبارت زیر را دیکال، -1 است پس حتماً $(x-2)^3$ بوده و داریم :

$$y = \sqrt[3]{x^3 - 4x^2 + 12x - 8} \rightarrow a = -4, b = 12 \rightarrow D_y = [-4, 12]$$

$$x = -4 \rightarrow y = -1$$

$$x = 12 \rightarrow y = 10$$

$$\Rightarrow R_y = [-1, 10]$$