

$f(x) = \sqrt{x(1-|x|)}$

$D_f \Rightarrow x(1-|x|) \geq 0$

$\frac{-1}{+} \quad \frac{0}{-} \quad \frac{1}{+} \quad \frac{-}{-}$

$(-\infty, -1] \cup [0, 1)$

نسبتی $\min = n = 0$
 نسبتی $\max = m = 1$
 کجایی $k = 4$

$m+n+k = 5$

۲

$f(x) = \sqrt{x} + \sqrt{a-2x} \rightarrow D_f \Rightarrow x \geq 0, a-2x \geq 0 \rightarrow D_f = [0, \frac{a}{2}]$

$\max f(x) \Rightarrow x = \frac{a}{4} : \sqrt{\frac{a}{4}} + \sqrt{a - \frac{a}{2}} = \sqrt{\frac{a}{2}}$

$\min f(x) \Rightarrow x = 0 : \sqrt{0} + \sqrt{a} = \sqrt{a}$

$\sqrt{a} \times \frac{\sqrt{a}}{\sqrt{2}} = \sqrt{12} \rightarrow a = \sqrt{24}$

$[a] = [\sqrt{24}] = [4, \dots] = 4$

۲

$f(x) = \begin{cases} \frac{x^2(x^2-4)}{x^2-1} & x \geq 2, x \leq -2 \\ \frac{-x^2(x^2-4)}{x^2-1} & -2 < x < 2 \\ x \neq \pm 1 \end{cases}$

نسبتی ~~است~~ نسبی

۳

$f(x) = ax^3 + bx^2 + cx + d$ $f'(x) = 3ax + 2bx + c$

$f(0) = 0 \rightarrow d = 0$ $f'(0) = 0 \rightarrow c = 0$

$f(1) = 1 \rightarrow a + b = 1$ $f'(1) = 0 \rightarrow 3a + 2b = 0$

$a + 2(a+b) = 0 \rightarrow a = -2$
 $b = 3$ } $ab = -6$

۴

$f(x) = \begin{cases} x(3-x^2) & -\sqrt{3} \leq x \leq \sqrt{3} \\ -x(3-x^2) & x > \sqrt{3} \text{ یا } x < -\sqrt{3} \end{cases}$

$\min : (-1, -2)$

$[-1, 1]$ \min مطلق در بازه $[0, \dots]$

۵

$$f(x) = x^r |x| + 3ax^r + b$$

$$f(-1) = 1 \rightarrow x = x + 3a + b \rightarrow 3a = -b \rightarrow \frac{b}{a} = -3$$

6

$$f(x) = \frac{ax + 3}{(a+1)x + (a-1)} \rightarrow \text{مقام صفر} = (a+1)x + (a-1) = 0$$

$$x = \frac{-a+1}{a+1}$$

مقدار جانب چاقم $f(x)$ باطل
استمریم تابع $g(x)$ برابر است:

$$g(x) = \frac{3}{x} + x + \frac{a}{4} \rightarrow \text{ent} \left|^{-\frac{1}{x}} \right. \Rightarrow \frac{1-a}{a+1} = -\frac{1}{3} \quad a = 2$$

7

$$f(x) = \frac{3x + 3}{3x + 1} \rightarrow f(x) = 0 \quad \frac{3x + 3}{3x + 1} = 0 \quad x = -\frac{3}{3} = -1$$

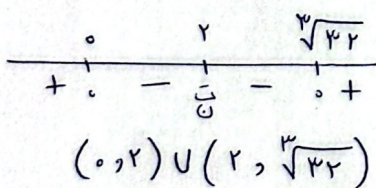
$$f(x) = \frac{bx^r + 7}{2x^r + ax + 1} \quad \text{مقام صفر} = \frac{1}{2} \rightarrow 1 - \frac{a}{2} + 1 = 0 \quad \frac{a}{2} = 2 \quad a = 4$$

$$\text{صاحب} = 3 \rightarrow \frac{b}{2} = 3 \quad b = 12$$

8

$$\frac{b}{a} = \frac{12}{2} = 6$$

$$f(x) = \frac{x^2}{x^2 - 1} \rightarrow f'(x) = \frac{2x^2(x^2 - 1) - (x^2)(2x)}{(x^2 - 1)^2} \Rightarrow f'(x) = \frac{x^2(x^2 - 2)}{(x^2 - 1)^2}$$



$$\min_{\text{بزرگ}} = \frac{2}{\sqrt{2} - 1}$$

9

$$f(x) = \frac{2x^2(x^2 - 4) - 2x(2x^2 - 4)}{(x^2 - 4)^2} = \frac{2x(2x^2 - 4x^2 - (2x^2 - 4))}{(x^2 - 4)^2}$$

10

$$2x^2 - 4x^2 - 2x^2 + 4 = 0 \rightarrow -4x^2 + 4 = 0 \rightarrow x^2 = 1 \rightarrow x = \pm 1$$

$$-4x^2 + 4 = 0 \rightarrow x^2 = 1 \rightarrow x = \pm 1$$

$$-4x^2 + 4 = 0 \rightarrow x^2 = 1 \rightarrow x = \pm 1$$

