

مثلاً $f(x) = x^r + 2ax^r + b$

مثلاً $f(x) = -x^r + 2ax^r + b \xrightarrow{A(-1,1)} 1 + 2a + b = 1 \rightarrow 2a + b = 0 \rightarrow b = -2a$ ①

$f'(x) = -rx^{r-1} + 2ax^{r-1} \xrightarrow{f'(a)=0} -r - 2a = 0 \rightarrow a = -\frac{r}{2} \xrightarrow{①} b = \frac{r}{2} = \frac{b}{a} = -2$

A) $\frac{b}{a} = \frac{1}{2} \rightarrow y = \frac{r}{r}(\frac{1}{2}) + (-\frac{1}{2}) + \frac{5}{4} = \frac{r}{2} \rightarrow A(-\frac{1}{2}, \frac{r}{2})$

B) $\frac{b}{a} = \frac{2}{1} \rightarrow \frac{a}{a+1} = \frac{2}{3} \rightarrow a = 2 \Rightarrow y = \frac{2x+2}{3x+1} \xrightarrow{y=0} 2x+2=0 \rightarrow x = -\frac{2}{1}$

ب) $\frac{b}{a} = \frac{1}{2} = 2 \rightarrow b = 12$ $\frac{b}{a} = \frac{2}{1} = -\frac{1}{2} \rightarrow \varepsilon(\frac{1}{\varepsilon}) + (-\frac{a}{\varepsilon}) + 1 = 0 \rightarrow a = 2$

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

$D_f = \mathbb{R} - \{2\}$

$f(x) = \frac{x^4}{x^2-1} \rightarrow f'(x) = \frac{x^4 - 2x^2}{(x^2-1)^2} \rightarrow x^4 - 2x^2 = 0 \rightarrow x^2(x^2-2) = 0$
 $x = 0, \pm\sqrt{2}$
 نقاط بحرانی: $x = 0, \pm\sqrt{2}$

x	0	±	±	±
f	+	+	-	-
f'	+	+	-	-

ب) $\frac{b}{a} = \frac{12}{2} = 6$

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$f(x) = \frac{x^4 - 2}{x^2 - 2} \rightarrow f'(x) = \frac{2x^3 - 4x}{(x^2 - 2)^2} \rightarrow 2x^3 - 4x = 0 \rightarrow 2x(x^2 - 2) = 0$
 $x = 0, \pm\sqrt{2}$
 $D_f = \mathbb{R} - \{\sqrt{2}, -\sqrt{2}\}$

x	-2	-√2	0	√2	2
f	+	-	+	-	+
f'	+	-	+	-	+

$x = \pm\sqrt{3-2\sqrt{2}}$

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

$$f'(x) = \pm \frac{x^2(x^2-2)}{x^2-1} \rightarrow f'(x) = \pm \frac{(x^2-1)(x^2-1) - (x^2-x^2)2x}{(x^2-1)^2} = 0 \quad \underline{13}$$

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

$$\hookrightarrow x^4 - 2x^2 + 2 = 0 \quad (\text{درجه 4})$$

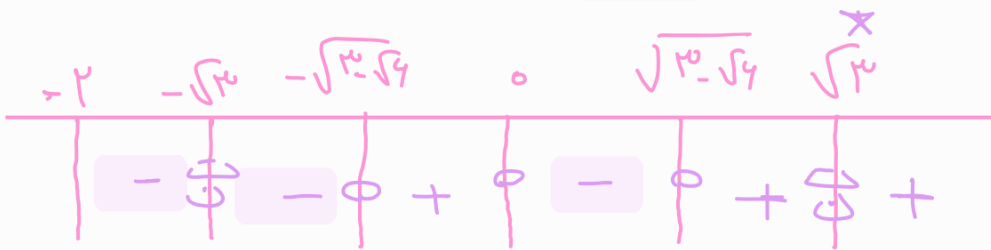
حالا 2, 2 - ریشه های کده معلق و تعدادی صفر ریشه ای مستقیم است پس 3 نقطه ای همونی داره!

$$f'(x) = \frac{2x^3(x^2-3) - 2x(x^2-3)}{(x^2-3)^2} = \frac{2x[(2x^2-4x^2) - (x^2-3)]}{(x^2-3)^2} \quad \underline{10}$$

$$2x^2 - 4x^2 + 4x = 0 \rightarrow 2x(x^2 - 4x^2 + 3) = 0 \rightarrow x = 0$$

$$\hookrightarrow x^2 = 3$$

$$x^2 - 4x + 3 = 0 \rightarrow x = \frac{4 \pm \sqrt{16}}{2} \rightarrow x = \pm \sqrt{3-4}$$



در 3 بازه اکیدا نزولی است!