

۲. اولی

آرنامی کیا - تکلیف ۲۹

1.  $f(x) = \begin{cases} \sqrt{x-x^2} & x \geq 0 \\ \sqrt{x+x^2} & x < 0 \end{cases} \Rightarrow f'(x) = \begin{cases} \frac{1-2x}{\sqrt{1-2x}} & x > 0 \\ \frac{1+2x}{\sqrt{1+2x}} & x < 0 \end{cases}$

بجائی  $\Rightarrow \sqrt{1-2x} = 0 \Rightarrow x = \frac{1}{2} \checkmark$   
 عموماً نہ سبب  $\Rightarrow \sqrt{1+2x} = 0 \Rightarrow x = -\frac{1}{2}$

Dp:  $(-\infty, -1] \cup [0, 1]$

	0	$\frac{1}{2}$	1	
y'	+	-	+	
y	↘	↗	↘	

$\Rightarrow \frac{1}{2}$  سبب max

$m=1, n=0, k=1$   
 $m+k+n=2$   
 $\{0, \pm \frac{1}{2}\}$

2.  $f'(x) = \frac{1}{\sqrt{ax}} - \frac{1}{\sqrt{a-2x}} = 0 \Rightarrow x = 0, \frac{a}{4} \leq \frac{a}{4} \leq \frac{a}{4}$

$f(\frac{a}{4}) = \sqrt{\frac{a}{4}}, f(\frac{a}{4}) = \sqrt{\frac{3a}{4}}, f(0) = \sqrt{a}$

$\sqrt{\frac{3a}{4}} + \sqrt{\frac{a}{4}} = 12 \Rightarrow a = 36$

3.  $\frac{x^2 + 12x - 41}{x^2 - 1} \xrightarrow{\text{فصل است}} \frac{x^2 + 12x - 41}{x^2 - 1} \rightarrow d' = \frac{(2x+12)(x^2-1) - 2x(x^2-1)}{(x^2-1)^2} = 0$

$\Rightarrow 2x+12 = 2x \Rightarrow 12 = 0$  (مستطک)

exit to  $\{-2, 0, 2\}$

4.  $3ax^2 + 2bx + c \xrightarrow{(0,0)} c=0 \xrightarrow{(1,0)} 3a+2b=0 \Rightarrow a = -\frac{2b}{3}$

$ax^3 + bx^2 + cx + d \xrightarrow{(0,0)} d=0 \xrightarrow{(1,1)} a+b=1 \Rightarrow a = -b+1$

$ab = -9$

5.  $f(x) = 3x - x^3 \Rightarrow f'(x) = 3 - 3x^2 = 0 \Rightarrow x = \pm 1$

	$-\frac{1}{\sqrt{3}}$	-1	1	$\sqrt{3}$
y'	-	+	-	+
y	↘	↗	↘	↗

$f(-\frac{1}{\sqrt{3}}) = -\frac{9}{2\sqrt{3}}$   
 $f(-1) = -2, f(1) = 2, f(\sqrt{3}) = 0$

6.  $y = -x^3 + 3ax^2 + b \rightarrow y' = -3x^2 + 6ax = 0 \Rightarrow a = -\frac{1}{2}$

$(-1, 1) \rightarrow 1 + 3a + b = 1 \Rightarrow b = \frac{3}{2}$

$\frac{b}{a} = -3$

7.  $\min(\frac{-b}{3a}, \frac{-\Delta}{3a}) \Rightarrow S(-\frac{1}{3}, \frac{2}{3})$

$\frac{a}{a+1} = \frac{2}{3} \Rightarrow a = 2$

$\frac{2a+3}{3a-1} = 0 \Rightarrow a = -\frac{3}{2}$

8.  $A(-\frac{1}{3}, 3)$

$f(-\frac{1}{3})^2 + a(-\frac{1}{3}) + 1 = 0 \Rightarrow \frac{b}{3} = 3 \Rightarrow b = 12$

$-\frac{a}{3} = -2 \Rightarrow a = 6$

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

9.  $f'(x) = \frac{(x^3-1)(3x^2) - (3x^2)(x^3)}{(x^3-1)^2} = \frac{x^2(3x^3-3x^3)}{(x^3-1)^2} = 0$

	0	1	$\sqrt[3]{E}$
y'	+	-	+
y	↗	↘	↗

کدام ترین باره  $(\sqrt[3]{E}-1)$

10.  $f'(x) = \frac{3x^2(x^2-3) - 2x(x^2-3)}{(x^2-3)^2} = \frac{3x^4 - 12x^2 - 2x^3 + 6x}{(x^2-3)^2} = 0$

	-2	$-\sqrt{3}$	$-\sqrt{3}$	0	$\sqrt{3}$	$\sqrt{3}$	2
y'	-	-	+	-	+	+	
y	↘	↘	↗	↘	↗	↗	

درت باره اکیدا نزولی است