

آرٹھائی 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: $(-\infty, -1/2] \cup [1/2, \infty)$

	0	1/2	1	
y'	/	+	-	/
y	/	↘	↗	/

$\Rightarrow \frac{1}{2}$ سبب max

$m=1, n=0, k=8$
 $m+n+k=9$
 $\{0, \pm \frac{1}{2}\}$

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

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

$\sqrt{\frac{3a}{4}} + \sqrt{\frac{a}{4}} = 12 \Rightarrow a = 9$

3. $\frac{x^2 + 12x - 41}{x^2 - 1} \xrightarrow[\text{است}]{\text{فرضہ}}$ $\frac{x^2 + 12x - 41}{x^2 - 1} = 0 \Rightarrow (x^2 + 12x - 41)(x^2 - 1) - (x^2 - 1)^2 = 0$

$\Rightarrow x^2 + 12x - 41 - (x^2 - 1) = 0 \Rightarrow 12x - 40 = 0 \Rightarrow x = \frac{10}{3}$

exit to $\Rightarrow \{-2, 0, 2\}$ سبب (سبب دانا) (سبب دانا)

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

$\xrightarrow{(1,1)} a+b=1 \Rightarrow ab = -9$

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

	-3/2	-1	1	3/2
y'	/	-	+	-
y	/	↘	↗	↘

$f(-\frac{3}{2}) = -\frac{9}{4}$
 $f(-1) = -2$
 $f(1) = 2$
 $f(\frac{3}{2}) = 0$

6. $y = -x^2 + 2ax + b \Rightarrow y' = -2x + 2a = 0 \Rightarrow x = a$

$(-1, 1) \Rightarrow 1 + 2a + b = 1 \Rightarrow b = -2a$

$\frac{b}{a} = -2$

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

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

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

8. $A(-\frac{1}{2}, 3)$

$f(-\frac{1}{2})^2 + a(-\frac{1}{2}) + 1 = 0 \Rightarrow \frac{b}{4} = 3 \Rightarrow b = 12$

$-\frac{a}{4} = -2 \Rightarrow a = 8$

$\frac{b}{a} = \frac{12}{8} = \frac{3}{2}$

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

	0	1	2	3
y'	+	-	+	-
y	↗	↘	↗	↘

سبب ترین باہر $(\sqrt{2}-2)$

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

	-2	1	2	3
y'	/	-	-	+
y	/	↘	↘	↗

دہ بارہ ایک بار تفریق است