(1)

$x=1 \to y=1-a$

$x=3 \to y=1-\frac{a}{3}$

$\Rightarrow m=\frac{1-\frac{a}{3}-1+a}{3-1}=\frac{\frac{2}{3}a}{2}=\frac{1}{3}a \Rightarrow f'(x)=\frac{a}{x^2} \Rightarrow \frac{a}{x^2}=\frac{1}{3}a$

$\Rightarrow \frac{1}{x^2}=\frac{1}{3} \Rightarrow x=\pm\sqrt{3}$

(2)

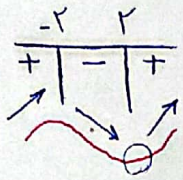
$f'(1)=1$ ، $x<0$ ← برنیساز: ناحیه سوم همان است

$f'(x)=6ax-5 \Rightarrow 6ax-5=1 \Rightarrow x=\frac{3}{2a}$

$f(x)=x \Rightarrow 2ax^2-5x+18a=\frac{3}{2a} \Rightarrow 36a^2-9=0 \Rightarrow a=\pm\frac{1}{2} \xrightarrow{x<0} a=-\frac{1}{2} \Rightarrow x=-3$

(3)

$f'(x)=3x^2-12 \Rightarrow$



$\Rightarrow f(2)=$ نسبی $\min = -11$

(4)

$f'(x)=3x^2+2ax-2b$ ← $x=1 \to b=0$ ، $x=-2 \to a=3$

$\Rightarrow f(x)=x^3+3x^2-4$

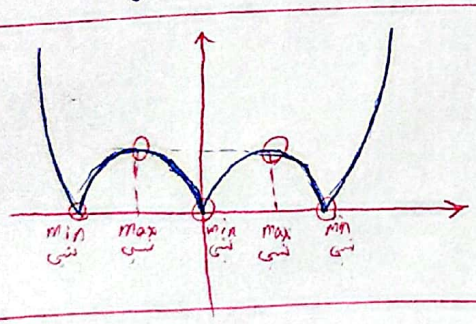
$x=0 \to y=-4$

$x=-2 \to y=0$

$\Rightarrow \sqrt{4+16}=\sqrt{20}=2\sqrt{5}$

(5)

شکل می کشیم:

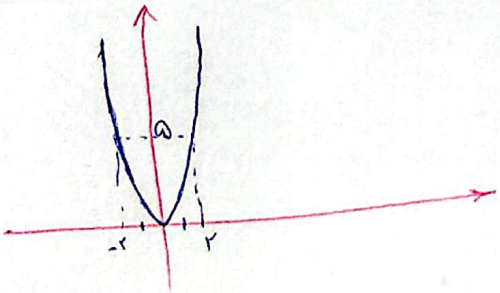


$m=2$

$n=3$ $\Rightarrow \frac{3}{2}=1.5$

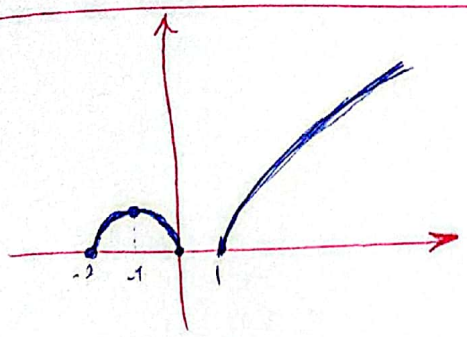
(6)

شکل می کشیم:



$\nexists$ 1 نقطه بحرانی دارد

(7)



$m = 1$

$n = 0$ $\Rightarrow$ $\frac{4 \times 1}{4} = 1$

$K = 4$

(8)

$f'_{(m)} = \frac{m(n-1+m) - (mn+2)}{(n-1+m)^2} < 0 \Rightarrow \frac{m^2 - m - 2}{(n-1+m)^2} < 0 \Rightarrow$

	-1		2	
+	|	−	|	+

(9)

$m = 0, 1$

$= \frac{n}{1-n^2} \Rightarrow f'_{(m)} = \frac{1-n^2 - (-2n)n}{(1-n^2)^2} = \frac{n^2+1}{(1-n^2)^2}$

	1		-1	
	↗	+	0	↗

در بازه نزولی است

در بازه صعودی است

$\frac{n}{1+n^2} \Rightarrow \frac{-n^2+1}{(1+n^2)^2} = f'(m) \Rightarrow$

	1		-1	
	↘	−	0	↘

در یک نقطه نزولی است

(10)