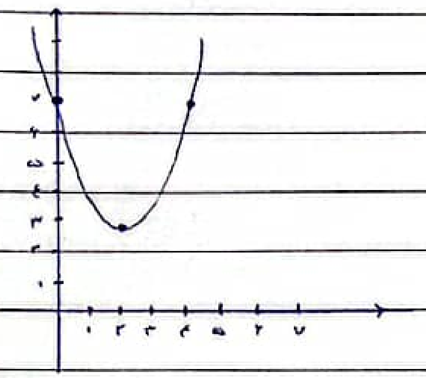
آرشام ایزدی یازدهم دفتر A تکلیف شماره ۱۲

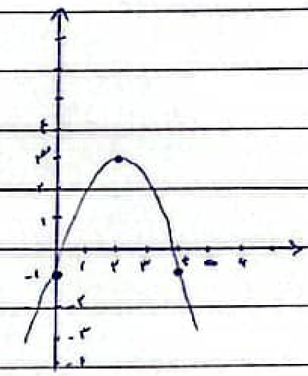
۱- الف) $y=x^2-4x+7$ $\quad x_s=\frac{-b}{2a}=\frac{4}{2}=2$ $\quad y_s=4-8+7=3 \longrightarrow$

x	۰	۲	۴
y	۷	۳	۷

الف)



ب)



ب) $y=-x^2+4x-1$ $\quad x_s=\frac{-b}{2a}=\frac{-4}{-2}=2$ $\quad y_s=-4+8-1=3 \longrightarrow$

x	۰	۲	۴
y	-۱	۳	-۱

۲- الف) $\Delta>0 \rightarrow (m+1)^2-4(2)(\frac{1}{2}m+2)>0 \rightarrow m^2-2m-15>0 \rightarrow (m-5)(m+3)>0$

x		-۳		۵	
	+	۰	-	۰	+

$\Longrightarrow m\in(-\infty,-3)\cup(5,+\infty)$

ب) $\Delta=0 \rightarrow (m+1)^2-4(2)(\frac{1}{2}m+2)=0 \rightarrow m^2-2m-15=0 \rightarrow (m-5)(m+3)=0 \rightarrow m=5\ ,\ m=-3$

ج) $\Delta<0 \rightarrow (m+1)^2-4(2)(\frac{1}{2}m+2)<0 \rightarrow m^2-2m-15<0 \rightarrow (m-5)(m+3)<0$

x		-۳		۵	
	+	۰	-	۰	+

$\Longrightarrow -3<m<5$

د) $\Delta\geq 0 \rightarrow (m+1)^2-4(2)(\frac{1}{2}m+2)\geq 0 \rightarrow m^2-2m-15\geq 0 \rightarrow (m-5)(m+3)\geq 0$

x		-۳		۵	
	+	۰	-	۰	+

$m\in(-\infty,-3]\cup[5,+\infty)$

۳- الف) $\Delta>0\quad S<0\quad P>0 \rightarrow (-2m-2)^2-4(m-2)(10)>0 \rightarrow 4m^2-32m+84>0 \rightarrow m^2-8m+21>0$

$\rightarrow$ همیشه برقرار $\rightarrow m\in R$ (۱) $\qquad S<0 \rightarrow \frac{-b}{a}<0 \rightarrow \frac{2m+2}{m-2}<0 \rightarrow 2m+2<0 \rightarrow 2m<-2 \rightarrow$

$\xrightarrow{\text{چون } \Delta>0} m<-1$ (۲) $\qquad P>0 \rightarrow \frac{c}{a}>0 \rightarrow \frac{10}{m-2}>0 \rightarrow m-2>0 \rightarrow m>2$ (۳)

(۱) $\cap$ (۲) $\cap$ (۳) $=\emptyset$

ب) $\Delta>0\quad P<0\quad S<0 \qquad \Delta>0 \rightarrow (-2m-2)^2-4(m-2)(10)>0 \rightarrow \underbrace{m^2-8m+21>0}_{\text{همیشه مثبت}} \rightarrow m\in R$ (۱)

$P<0 \rightarrow \frac{c}{a}<0 \rightarrow \frac{10}{m-2}<0 \rightarrow m-2<0 \rightarrow m<2$ (۲) $\qquad S<0 \rightarrow \frac{-b}{a}<0 \rightarrow \frac{2m+2}{m-2}<0 \rightarrow 2m+2<0$

$\rightarrow 2m<-2 \rightarrow m<-1$ (۳)

(۱) $\cap$ (۲) $\cap$ (۳) $= m<-1$

s.a.m

۴- الف) $P<0 \;,\; \Delta>0 \xrightarrow{\Delta>0} (-2m-2)^2-4(m-2)(10)>0 \to \underbrace{m^2-8m+21}_{\text{همیشه مثبت } (\Delta<0)}>0 \to m\in\mathbb{R}$ (1)

$P<0 \to \frac{c}{a}<0 \to \frac{10}{m-2}<0 \to m-2<0 \to m<2$ (2) $\qquad (1)\cap(2) = m<2$

ب) $x_S=-2 \to \frac{-b}{2a}=-2 \to \frac{2m+2}{2m-4}=-2 \to 2m+2=-4m+8 \to 6m=6 \to m=1$

۵- $\Delta\geq 0 \to (2\sin a)^2-4(\frac{\cancel{2}}{3})(\frac{3}{\cancel{2}})\geq 0 \to 4\sin^2 a\geq 4 \to \sin^2 a\geq 1 \to \sin^2 a=1 \Rightarrow \sin a=\pm 1$

$S>0 \to \frac{-b}{a}>0 \to \frac{2\sin a}{\frac{2}{3}}>0 \to 3\sin a>0 \xrightarrow{\sin a=\pm1} \boxed{\sin a=+1}$

$P>0 \to \frac{c}{a}>0 \to \frac{c}{a}>0 \to \frac{\frac{3}{2}}{\frac{2}{3}}>0 \to \frac{9}{4}>0$ ✓

$\Rightarrow \frac{2}{3}x^2-2x+\frac{3}{2}=0 \xrightarrow{\Delta=0} x=\frac{-b}{2a} \longrightarrow x=\frac{2}{\frac{4}{3}}=\frac{3}{2}$

۶- $y=\frac{(2x^2-2x-1)(3x^2-3x-5)}{1-x^2}=\frac{6x^4-12x^3-11x^2+13x+5}{1-x^2}=-6x^2+13x+5$

$y=-6x^2+13x+5 \to x_{max}=\frac{-b}{2a}=\frac{13}{12} \longrightarrow y_{max}=-6(\frac{13}{12})^2+13(\frac{13}{12})+5=\frac{289}{24}$

۷- $3S=5P+7 \to 3(\frac{m+2}{m})=5(\frac{-2}{m})+7 \to \frac{3m+6}{m}=\frac{-10+7m}{m} \to 3m+6=-10+7m$

$\to 4m=16 \to m=4 \rightsquigarrow 4x^2-6x-2=0 \to 2x^2-3x-1=0$

$\alpha^2+\beta^2=S^2-2P \rightsquigarrow \alpha^2+\beta^2=(\frac{3}{2})^2-2(\frac{-1}{2})=\frac{9}{4}+\frac{4}{4}=\frac{13}{4}$

۸- $S=\alpha+\beta=5 \qquad P=\alpha.\beta=+2$

$\frac{\beta^5+4\alpha}{5\beta^2}=\frac{4}{5}\frac{\alpha}{\beta^2}\times\frac{1}{5}\beta^3=\frac{4}{5}\times\frac{\alpha}{\frac{4}{\alpha^2}}+\frac{1}{5}\beta^3 \to \frac{1}{5}\alpha^3+\frac{1}{5}\beta^3=\frac{1}{5}(\alpha^3+\beta^3)$

$\to \frac{1}{5}(S^3-3SP) \to \frac{1}{5}(5^3-3\times5\times2)=\frac{1}{5}\times95=19$

$c = 4 \qquad x = 2 \longrightarrow 4 + 10 = 4a + 2b + 4 \longrightarrow 2a + b = 5$ ۹

$x = -3 \longrightarrow -6 + 10 = 9a - 3b + 4 \longrightarrow 3a - b = 0 \longrightarrow 5a = 5 \longrightarrow a = 1 \;,\; b = 3$

$y = x^2 + 3x + 4 \longrightarrow x_s = \frac{-b}{2a} = \frac{-3}{2} \longrightarrow$ محور تقارن $: x = -\frac{3}{2}$

$\Delta = 0 \longrightarrow (m+1)^2 - 4(2)(m+6) = 0 \longrightarrow m^2 - 6m - 47 = 0 \longrightarrow m = 3 \pm 2\sqrt{14}$ ۱۰

$x_s = \frac{-b}{2a} = \frac{-m-1}{4} \longrightarrow$ برای اینکه در ناحیه اول مماس باشد $\longrightarrow x_s > 0 \longrightarrow \frac{-m-1}{4} > 0 \longrightarrow m < -1$

$\longrightarrow 3 - 2\sqrt{14}$ قابل قبول $\longrightarrow m = 3 - 2\sqrt{14}$