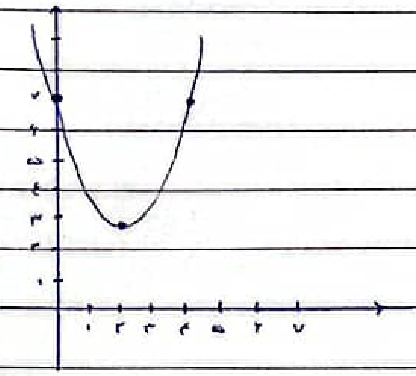
۱۷,۷۵

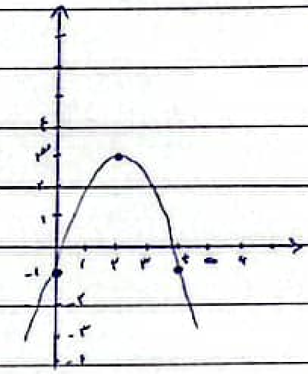
آزمایشی یازدهم دفتر A تکلیف شماره ۱۲

۱- الف) $y = x^2 - 4x + 7$ $\quad x_S = \frac{-b}{2a} = \frac{4}{2} = 2 \quad y_S = 4 - 8 + 7 = 3 \longrightarrow \begin{vmatrix} 0 \\ 7 \end{vmatrix} \begin{vmatrix} 2 \\ 3 \end{vmatrix} \begin{vmatrix} 4 \\ 7 \end{vmatrix}$

الف)



ب)



۲

ب) $y = -x^2 + 4x - 1$ $\quad x_S = \frac{-b}{2a} = \frac{-4}{-2} = 2 \quad y_S = -4 + 8 - 1 = 3 \longrightarrow \begin{vmatrix} 0 \\ -1 \end{vmatrix} \begin{vmatrix} 2 \\ 3 \end{vmatrix} \begin{vmatrix} 4 \\ -1 \end{vmatrix}$

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		-3		5	
	+	0	−	0	+

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

۲

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		-3		5	
	+	0	−	0	+

$\Longrightarrow -3 < m < 5$

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		-3		5	
	+	0	−	0	+

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

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 (چون $\Delta < 0$) $\rightarrow m \in R$ ① $\quad S < 0 \rightarrow \frac{-b}{a} < 0 \rightarrow \frac{2m+2}{m-2} < 0 \rightarrow 2m + 2 < 0 \rightarrow 2m < -2 \rightarrow$

$\longrightarrow m < -1$ ② $\quad P > 0 \rightarrow \frac{c}{a} > 0 \rightarrow \frac{10}{m-2} > 0 \rightarrow m - 2 > 0 \rightarrow m > 2$ ③

۱,۵

① ∩ ② ∩ ③ $= \emptyset$

ب) $\Delta > 0 \quad P < 0 \quad S < 0 \qquad \Delta > 0 \rightarrow (-2m-2)^2 - 4(m-2)(10) > 0 \rightarrow m^2 - 8m + 21 > 0 \rightarrow m \in R$ ①
همیشه مثبت

$P < 0 \rightarrow \frac{c}{a} < 0 \rightarrow \frac{10}{m-2} < 0 \rightarrow m - 2 < 0 \rightarrow m < 2$ ② $\quad S < 0 \rightarrow \frac{-b}{a} < 0 \rightarrow \frac{2m+2}{m-2} < 0 \rightarrow 2m + 2 < 0$

$\rightarrow 2m < -2 \rightarrow m < -1$ ③ $\qquad \hookrightarrow -1 < m < 2$

① ∩ ② ∩ ③ $= m < -1$

$\hookrightarrow -1 < m < 2$

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

$P<0 \to \frac{c}{a}<0 \to \frac{1}{m-2}<0 \to m-2<0 \to m<2$ ② ①∩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- $\Delta\geq 0 \to (2\sin a)^2-4(\frac{1}{2})(\frac{2}{2})\geq 0 \to 4\sin^2 a\geq 4 \to \sin^2 a\geq 1 \to \sin^2 a=1 \Rightarrow \sin a=\pm 1$

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

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

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

۶-

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

$y=-4x^2+12x+3 \to x_{max}=\frac{-b}{2a}=\frac{12}{8} \xrightarrow{1-x^2} y_{max}=-4(\frac{12}{8})^2+12(\frac{12}{8})+3=\frac{289}{16}$

۷- $3S=aP+V \to 3(\frac{m+2}{m})=a(\frac{-2}{m})+V \to \frac{3m+6}{m}=\frac{-10+Vm}{m} \to 3m+6=-10+Vm$

$\to 6m=16 \to m=8 \to 6m^2-4m-2=0 \to 3m^2-2m-1=0$

$\alpha^2+\beta^2=S^2-2P \to \alpha^2+\beta^2=(\frac{2}{3})^2-2(\frac{-1}{3})=\frac{4}{9}+\frac{6}{6}=\frac{10}{9}$

۸- $S=\alpha+\beta=a \qquad P=\alpha\cdot\beta=+2$

$\frac{\beta^3+6\alpha}{a\beta^2}=\frac{6}{a}\frac{a}{\beta^2}\times\frac{1}{a}\beta^3=\frac{6}{a}\times\frac{a}{6}+\frac{1}{a}\beta^3 \to \frac{1}{a}a^3+\frac{1}{a}\beta^2=\frac{1}{a}(a^3+\beta^3)$

$\to \frac{1}{a}(S^3-3SP) \to \frac{1}{a}(a^3-3\times a\times 2)=\frac{1}{a}\times 9a=19$

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

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

$y_1 = x^2 + 3x + 4 \longrightarrow x_S = \frac{-b}{2a} = -\frac{3}{2} \longrightarrow$ محور تقارن $= x = -\frac{3}{2}$

۱ (نمره)

۱۰) $m^2 - 8m - 48 \longrightarrow m = 12\,,\ -4$ ✓

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

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

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

۰٫۲۵ (نمره)