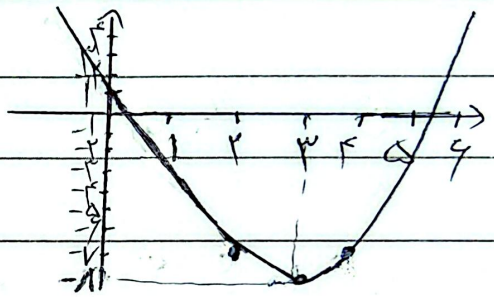
نام درس: ریاضی | به نام آفریدگار مهر | دهم تجربی و ریاضی (دختران)

۱- الف) $a>0 \rightarrow \min$ $\quad ext\left|\begin{array}{l} -\frac{b}{2a}=\frac{4}{2(4)}=1 \\ \frac{-\Delta}{4a}=\frac{-16+8}{8}=-1 \end{array}\right.$

ب) $a<0 \rightarrow \max$ $\quad ext\left|\begin{array}{l} \frac{-b}{2a}=\frac{-4}{-8}=\frac{4}{4} \\ \frac{-\Delta}{4a}=\frac{-9+40}{-8}=-\frac{31}{8} \end{array}\right.$

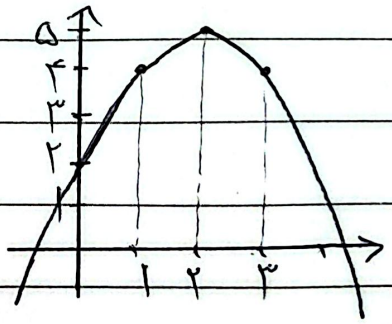
۲- الف) $\frac{-b}{2a}=\frac{6}{2}=3 \quad \frac{-\Delta}{4a}=\frac{-36+4}{4}=-8$

x	2	3	4
y	-7	-8	-7



ب) $\frac{-b}{2a}=\frac{-4}{-2}=2 \quad \frac{-\Delta}{4a}=\frac{-16+4}{-4}=3$

x	1	2	3
y	4	5	4



۳- $\alpha+\beta=1 \quad \alpha\beta=2 \rightarrow x^2-x-2$

$$\begin{array}{l} 2x^3-kx^2-9x-2 \;\big|\; x^2-x-2 \;\big|\; 2x+k \\ -(2x^3-2x^2-4x) \\ \hline (k+2)x^2-x-2 \\ -(k+2)x^2-(k+2)x+2k+4 \\ \hline (k+3)x+2k+6 \end{array}$$

باید صفر باشد $\rightarrow k+3=0 \rightarrow k=-3$

$2k+6=0 \rightarrow k=-3$

۴- $(\sqrt{\alpha}-\sqrt{\beta})^2=(1)^2 \rightarrow \alpha+\beta-2\sqrt{\alpha\beta}=1 \quad 2m-2\sqrt{m}-1=0 \rightarrow \sqrt{m}=t$

$3t^2-2t^2-1=0 \rightarrow (t-1)(2t+1) \rightarrow -\frac{1}{2} \times \quad t=1 \rightarrow m=1$

$-\frac{m}{2}=-\frac{1}{2}$ ← حاصلضرب ریشه‌ها

۵- $\Delta = m^2+4m+4-8m = (m-2)^2$ $\quad x = \frac{-b\pm\sqrt{\Delta}}{2a} \Rightarrow x = \frac{m+2\pm(m-2)}{4}$

$x_1 = \frac{m+2+m-2}{4} = \frac{2m}{4} = \frac{m}{2}$ ، $x_2 = \frac{m+2-m+2}{4} = \frac{4}{4} = 1$

$x=0 \longrightarrow y=m$ نقطه‌ی تلاقی با محور عرض‌ها $\quad (\frac{m}{2},0)$ ، $(1,0)$ ، $(0,m)$ ← رئوس

$S = \frac{1}{2}\times|AB|\times|m| \longrightarrow \frac{1}{2}\times|1-\frac{m}{2}|\times m = \frac{3}{4} \longrightarrow |1-\frac{m}{2}| = \frac{3}{2}$

$(1-\frac{m}{2})m = \frac{3}{2} \longrightarrow m-\frac{m^2}{2} = \frac{3}{2} \longrightarrow 2m-m^2-3=0 \longrightarrow \Delta<0$ ✗

$-(1-\frac{m}{2})m = \frac{3}{2} \longrightarrow -m+\frac{m^2}{2} = \frac{3}{2} \longrightarrow -2m+m^2-3=0 \longrightarrow \Delta>0 \longrightarrow m = \frac{3}{2}, -\frac{1}{2}$

$(m-3)(m+1)$

۶- $\frac{-\Delta}{4a} = \frac{-9+4a^2}{4a} = \frac{7}{8} \longrightarrow 32a^2-28a-72=0 \longrightarrow 8a^2-7a-18=0$

$(a-2)(8a+9)$

$a=2$ ← بیشترین مقدار ممکن برای a (min) $\quad \longrightarrow a<0$ ✗

۷- $\frac{\sqrt{\Delta}}{|a|} = 2 \longrightarrow \frac{\sqrt{a^2+1+2a-4a}}{|a|} = \frac{\sqrt{(a-1)^2}}{|a|} = \frac{|a-1|}{|a|} = 2 \longrightarrow a=3,\ a=-1$

$x^2-5x+3=0 \xrightarrow{\Delta} x=1,3$ $\quad x^2-10x+b=0 \xrightarrow{\Delta} \sqrt{100-4b}=1 \longrightarrow 100-4b=1 \longrightarrow b=\frac{99}{4}$ ← غیرطبیعی

$x^2-10x+\frac{99}{4}=0 \longrightarrow (x-\frac{9}{2})(x-\frac{11}{2})$ $\quad x=\frac{9}{2},\frac{11}{2}$ $\quad (\frac{11}{2}\times2)-(\frac{9}{2}\times1)=11$

۸- $y=-ax^2+ax+2 \longrightarrow \frac{1}{4}, \frac{a}{4}+2$ ، $y=2bx^2-bx-1 \longrightarrow \frac{1}{4}, -\frac{b}{8}=-1$

$2b\times\frac{1}{16}-b(\frac{1}{4})-1 = \frac{a}{4}+2 \longrightarrow \frac{a}{4} = -3 \longrightarrow a=-12$

$-\frac{a}{16}+\frac{a}{4}+2=-\frac{b}{8}=-1 \longrightarrow -\frac{b}{8} = \frac{12}{16} \longrightarrow b=-6$ $\quad b-a=-6-(-12)=6$

۹- $\alpha+\beta = -\frac{2}{10\alpha}$ $\quad \alpha\beta = \frac{\beta}{20\alpha} \longrightarrow 20\alpha^2\beta=\beta \longrightarrow \alpha=\pm\frac{1}{5} \longrightarrow \alpha=-\frac{1}{5}$

$-\frac{1}{5}+\beta = \frac{2}{5} \longrightarrow \beta=1$ ، $a=\frac{1}{5} \longrightarrow \frac{1}{5}+\beta=-\frac{2}{5} \longrightarrow \beta=-1$ ✗

$\frac{-2}{5\alpha} = \frac{2}{5}$ $\quad -\frac{\Delta}{4a} = \frac{9}{5}$ ← ناصیه اول ← سهمی

۱۰- $a+b = a^4+b^4-12$ $\quad a+b=4ab$ $\quad a+b = ((a+b)^2-2(a+b-1))-12$

$a+b=t \longrightarrow t = t^2-2t-10 \longrightarrow t^2-2t-10=0 \longrightarrow (t-5)(t+2)$ $\quad t=5$

a,b طبیعی‌اند ← α $\quad a+b=5$