نام و نام خانوادگی ......ماهان بابشلی...... پاسخنامه تشریحی تکلیف شماره ...۱۳... کلاس ...دهم تجربی B......

۱

$y=(a-1)x^2+x+3=0$

متقارن نسبت؟ $\rightarrow x=2$ $\Rightarrow x_s=\frac{-b}{2a}=2 \rightarrow \frac{-1}{2a-2}=2 \Rightarrow 4a-4=-1 \Rightarrow 4a=3 \Rightarrow a=\frac{3}{4}$

محور x ها را با طول مثبت قطع می‌کند؟

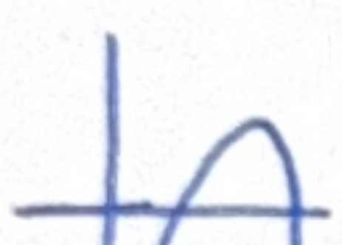
$y=-\frac{1}{4}x^2+x+3=0$

ریشه‌ها $\rightarrow \frac{-1\pm\sqrt{1+4\times\frac{1}{4}\times 3}}{2\times -\frac{1}{4}}$ $\rightarrow \frac{-1+2}{-\frac{1}{2}}=-2$ ، $\rightarrow \frac{-3}{-\frac{1}{2}}=+6$

۲

$f(x)=mx^2-5x+m$ محدوده m؟

x		x_1		x_2	
$f(x)$	$-$	0	$+$	0	$-$

وقتی جدول تعیین علامت بدین شکل است یعنی که سهمی چنین شکلی داشته ←  $\rightarrow m<0$ ①

معادله دارای ۲ ریشه است ⇐ $\Delta>0$ ③

$25-4\times m\times m>0$

$25-4m^2>0$

$4m^2<25 \Rightarrow m^2<\frac{25}{4} \Rightarrow m<\frac{5}{2}$ ، $m>-\frac{5}{2}$ ②

$① \cap ② \cap ③ \Rightarrow -\frac{5}{2}<m<0$

۳

$\frac{3-\sqrt{5}}{3}$, $\frac{3+\sqrt{5}}{3}$ $\qquad y=x^2-Sx+P$

$S=\frac{3-\sqrt{5}}{3}+\frac{3+\sqrt{5}}{3}=2$

$P=\left(\frac{3-\sqrt{5}}{3}\right)\left(\frac{3+\sqrt{5}}{3}\right)=\frac{9-5}{9}=\frac{4}{9}$

$\Rightarrow y=x^2-2x+\frac{4}{9}$ —ضریب صحیح $\times 9$→ $9y=9x^2-18x+4$

۴

$y=2x^2-8x+m+2=0$ $\qquad \alpha<\beta$ $\qquad 3\alpha^2+\beta^2=12$ $\qquad m=?$

$S=\frac{8}{2}=4 \Rightarrow \alpha+\beta=4 \Rightarrow \beta=4-\alpha$

$3\alpha^2+(4-\alpha)^2=12 \Rightarrow 3\alpha^2+16+\alpha^2-8\alpha-12=0$

$4\alpha^2-8\alpha+4=0$

$\alpha^2-2\alpha+1=0$

$(\alpha-1)^2=1 \Rightarrow \alpha=1$

$\text{if } \alpha=1 \Rightarrow \beta=4-1=3$

$2x^2-8x+m+2=0$

$P=\frac{c}{a}=\alpha.\beta \Rightarrow \frac{m+2}{2}=3\times 1 \Rightarrow m=6-2=4$

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$S\left|\begin{array}{l} x_s=2 \\ y_s=9 \end{array}\right.$

عرض از مبدأ ← 5 (c)

در کدام بازه سهمی بالای محور x؟

$y=ax^2+bx+c$

$x_s=\frac{-b}{2a}=2 \Rightarrow b=-4a$ ، $c=5$ $\rightarrow ax^2-4ax+5 \xrightarrow{(2,9)} 4a-8a+5=9$

$-4a=4 \Rightarrow a=-1$

$y=-x^2+4x+5 \Rightarrow$ ریشه‌ها: -1 , 5

	-1		5	
$-$		$+$		$-$

بازه: $(-1,5)$ بالای محورها

$\alpha x^2 - 7x + 9\beta = 0 \qquad \beta > 0 \qquad \frac{1}{\alpha} + \frac{1}{\beta} = ?$

if $x = \alpha \Rightarrow \alpha^3 - 7\alpha + 9\beta = 0$

if $x = \beta \rightarrow \alpha\beta^2 - 7\beta + 9\beta = 0 \Rightarrow \alpha\beta^2 + 2\beta = 0 \rightarrow \beta(\alpha\beta + 2) = 0 \xrightarrow{\beta \neq 0} \alpha\beta = -2$ 6

$P = \frac{c}{a} = \frac{9\beta}{\alpha} = -2 \Rightarrow 9\beta = -2\alpha \Rightarrow \alpha^3 - 7\alpha + 9\beta = 0 \xrightarrow{9\beta = -2\alpha} \alpha^3 - 9\alpha = 0$

$\alpha(\alpha^2 - 9) \Rightarrow \alpha = 0$ یا 3 یا -3

$9\beta = -2\alpha \xrightarrow{\beta > 0,\ \beta \neq 0} \alpha < 0 \Rightarrow \alpha = -3 \quad \alpha\beta = -2 \xrightarrow{\alpha = -3} \beta = \frac{2}{3}$

$\frac{1}{\alpha} + \frac{1}{\beta} = \frac{\beta + \alpha}{\alpha\beta} = \frac{\frac{2}{3} - 3}{-2} = \frac{\frac{2-9}{3}}{-2} = \frac{-7}{-6} = \frac{7}{6}$

$x^2 + mx - 2m = 0 \qquad \alpha^2 - m\beta = 8 \qquad S = -m \qquad P = -2m$

$(-)\ \begin{cases} \alpha^2 + m\alpha - 2m = 0 \\ \beta^2 + m\beta - 2m = 0 \end{cases}$

$\alpha^2 - \beta^2 + m\alpha - m\beta = 0$

$8 - \beta^2 + m\alpha = 0 \rightarrow (+)\ \begin{cases} \beta^2 - m\alpha = 8 \\ \alpha^2 - m\beta = 8 \end{cases}$

$\alpha^2 + \beta^2 - m(\alpha + \beta) = 16$

$S^2 - 2P - m(S) = 16$ 7

$m^2 + 4m + m^2 - 16 = 0$

$2m^2 + 4m - 16 = 0$

$m^2 + 2m - 8 = 0 \longrightarrow m = -4$ یا $+2$

if $m = -4 \Rightarrow x^2 - 4x + 8 = 0$

if $m = 2 \Rightarrow x^2 + 2x - 4 = 0$

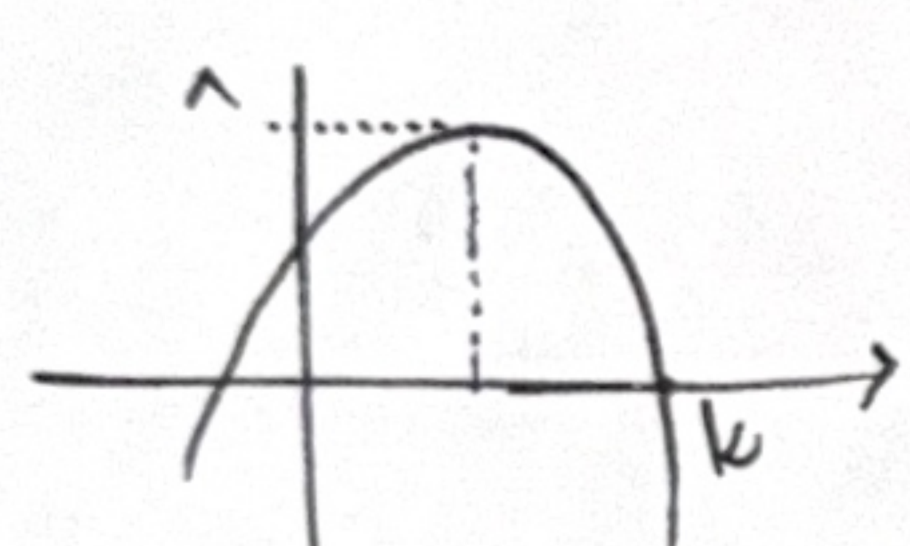
$\Delta < 0$

$m = 2$

if $m = 2 \Rightarrow x^2 + 2x - 4 \downarrow S$

-2

$f(x) = mx^2 + 4x + \frac{m}{2} + 7 \qquad k = ?$



$y_s = 8$

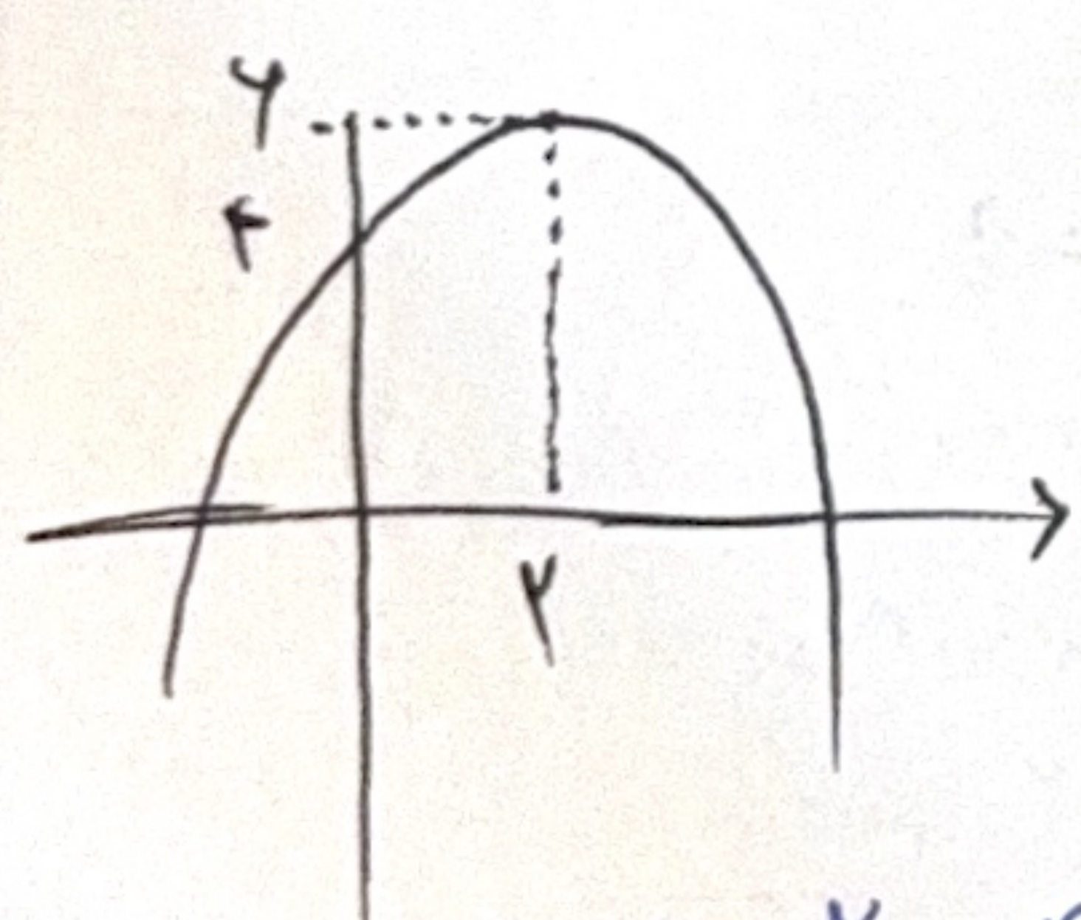
$x_s = \frac{-4}{2 \times m} = \frac{-2}{m} \Rightarrow y_s = \frac{m \times 4}{m^2} - \frac{8}{m} + \frac{m}{2} + 7 = 0 \Rightarrow \frac{8 - 16 + m^2 + 14m}{2m} = 8$ 8

$m^2 + 14m - 8 = 16m$

$m^2 - 2m - 8 = 0 \Rightarrow m = 4$ یا -2

$x_s > 0 \Rightarrow \frac{-2}{m} > 0 \Rightarrow m < 0 \Rightarrow m = -2$

$y = -2x^2 + 4x - 1 + 7 \Rightarrow f(x) = -2x^2 + 4x + 6 = 0$ ریشه‌ها: 1) -1 2) 3 ، k ریشه‌ی مثبت است پس $k = 3$



$x_s = 2 \Rightarrow \frac{-b}{2a} = 2 \Rightarrow b = -4a$

$y_s = 6 \qquad y = ax^2 + bx + c$

$c = 4 \qquad y = ax^2 - 4ax + 4$

$\downarrow \binom{2}{6}$ 9

$4a - 8a + 4 = 6 \Rightarrow -4a = 2 \Rightarrow a = -\frac{1}{2}$

$y = -\frac{1}{2}x^2 + 2x + 4 \longrightarrow \frac{1}{\alpha} + \frac{1}{\beta} = \frac{\beta + \alpha}{\alpha\beta} \rightarrow \frac{4}{-8} = -\frac{1}{2}$

$x^2 - (4a + 4)x + (3a^2 + 6a + 3) = 0$

if $x = 2 \Rightarrow 4 - 2(4a + 4) + 3a^2 + 6a + 3 = 0 \Rightarrow 4 - 8a - 8 + 3a^2 + 6a + 3 = 0 \Rightarrow 3a^2 - 2a - 1 = 0$

$a = 1$ یا $a = -\frac{1}{3}$

if $a = 1 \Rightarrow x^2 - 8x + 12 \longrightarrow x = 2$ یا $x = 6 \qquad (x - 6)(x - 2) = x^2 - 8x + 12$ 10

if $a = -\frac{1}{3} \rightarrow x^2 - \frac{8}{3}x + \frac{4}{3} = 0 \Rightarrow \Delta = \frac{64}{9} - \frac{16}{3} = \frac{16}{9}$

$x = \frac{\frac{8}{3} \pm \frac{4}{3}}{2} \Rightarrow 2$ یا $\frac{2}{3}$