ملیکا محمدحسینی

$$\frac{(3m^2-2m-1)(2m^2-3m-5)}{1-m^2} \rightarrow 6m^4-13m^3-11m^2+13m+5$$

$$(1-m^2)(-6m^2+13m+5)$$

$$m \neq \pm 1$$

$$f(m) = -6m^2+13m+5 \qquad m_{max} = \frac{13}{12} \qquad f\left(\frac{13}{12}\right) = -6\left(\frac{13}{12}\right)^2+13\left(\frac{13}{12}\right)+5 = \frac{289}{24}$$

$$mx^2-(m+2)x-2=0 \qquad S = \frac{m+2}{m} \qquad P = \frac{-2}{m} \qquad m \neq 0$$

$$3S = 5P+7 \rightarrow 3\left(\frac{m+2}{m}\right) = 5\left(\frac{-2}{m}\right)+7 \rightarrow 3(m+2) = -10+7m$$

$$16 = 4m \rightarrow m = 4$$

$$S = \frac{4+2}{4} = \frac{3}{2} \qquad P = \frac{-2}{4} = -\frac{1}{2}$$

$$\boxed{S^2-2P = \left(\frac{3}{2}\right)^2-2\left(-\frac{1}{2}\right) = \frac{13}{4}}$$

$$\frac{4\alpha+\beta^5}{5\beta^2} \qquad x^2-5x+2=0 \qquad \beta^2-5\beta+2=0 \rightarrow \beta^2 = 5\beta-2$$

$$\alpha+\beta = 5 \qquad \alpha\beta = 2$$

$$\beta^5 = \beta^3 \times \beta^2 \rightarrow \beta(5\beta-2) = 5\beta^2-2\beta$$

$$\beta^3 = 5(5\beta-2)-2\beta = 23\beta-10$$

$$\beta^5 = (23\beta-10)(5\beta-2) = 115\beta^2-96\beta+20$$

$$115(5\beta-2)-96\beta+20 = 479\beta-210$$

$$4(5-\beta)+479\beta-210 = 475\beta-190$$

$$5\beta^2 = 25\beta-10$$

$$\frac{475\beta-190}{25\beta-10} = \frac{19(25\beta-10)}{25\beta-10} = \boxed{19}$$

نمودار $y_1 = ax^2+bx+c$ $\qquad y_2 = 2x+10$

$x = 2, -3$ $\qquad y = 4$ محور تقارن کجاست؟

$$a(0)^2+b(0)+c = 4 \rightarrow c = 4$$

$$ax^2+bx+4 = 2x+10 \rightarrow ax^2+(b-2)x-6=0$$

$$S = 2+(-3) = \frac{b-2}{a} \rightarrow a = b-2 \rightarrow b = a+2$$

$$P = 2(-3) = \frac{-6}{a} \rightarrow a = 1$$

$$b = a+2 = 1+2 \rightarrow b = 3 \qquad \frac{-b}{2a} \Rightarrow \frac{-3}{2(1)} = -\frac{3}{2} = -1.5$$

نمودار $y = 2x^2+(m+1)x+m+4$ مماس بر نیمساز ناحیه اول و سوم است: $y_2 = x$

$$2x^2+(m+1)x+m+4 = x \rightarrow 2x^2+(m+1-1)x+m+4=0 \rightarrow 2x^2+mx+m+4=0$$

$$\Delta = b^2-4ac = 0 \rightarrow m^2-4(2)(m+4) = 0 \rightarrow m^2-8m-48=0$$

$$(m-12)(m+4) = 0 \rightarrow m = 12,\ \boxed{m=-4}$$

$$x = \frac{-b}{2a} = -\frac{m}{4} \xrightarrow{m=12} -\frac{12}{4} = -3$$

$$\xrightarrow{m=-4} -\frac{-4}{4} = 1 \qquad m = 12 \times$$

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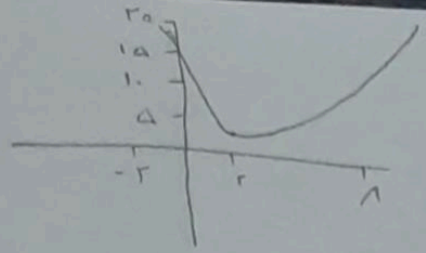
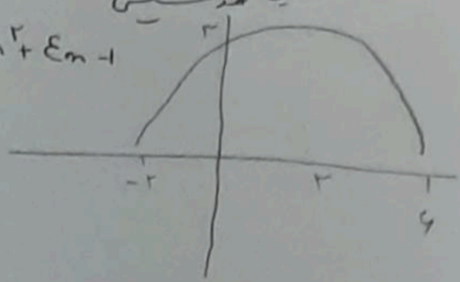
x^2-4x+7



$-x^2+4x-1$



$2x^2+(m+1)x+\frac{1}{2}m+2=0$

الف) ۲ ریشه متمایز

$\Delta>0 \quad b^2-4ac=(m+1)^2-4(2)(\frac{1}{2}m+2)=m^2+2m+1-4m-16>0$

$m^2-2m-15>0 \quad (m+3)(m-5)$ — $m<-3$, $m>5$

ب) ریشه مضاعف

$\Delta=0 \quad (m-5)(m+3)=0 \longrightarrow m=-3 \quad m=5$

ج) ریشه نداشته باشد

$\Delta<0 \quad (m-5)(m+3) \quad -3<m<5$

د) ریشه داشته باشد

$\Delta\geq 0 \quad m\leq -3 \quad m\geq 5$

$y=(m-2)x^2-2(m+1)x+10 \qquad S=\frac{2(m+1)}{m-2} \qquad P=\frac{10}{m-2}$

$b^2-4ac=4(\underbrace{m^2-8m+21}_{\Delta<0})$

$m\neq 2$

الف) هر دو ریشه حقیقی منفی باشد پس $S<0 \quad P>0$

$\frac{10}{m-2}>0 \to m-2>0 \to m>2$

ب) $\Delta>0 \quad S<0 \quad P<0 \qquad S=\frac{2(m+1)}{m-2} \qquad P=\frac{10}{m-2}$

$-(S)>0 \to S<0 \quad \boxed{m>-1} \leftarrow m+1>0$ و $m-2<0$ ؛ $\Delta=b^2-4ac=4(m+1)^2-10(m-2)=$

$\frac{10}{m-2}<0 \to \boxed{m<2}$ ؛ $4(\underbrace{m^2-8m+21}_{\Delta<0}) \to -1<m<2$

$y=(m-2)x^2-2(m+1)x+10$

الف) ۲ ریشه حقیقی داشته باشد و مختلف العلامة باشند

$\Delta>0 \quad P<0 \quad \Delta=4(\underbrace{m^2-8m+21}_{\Delta<0})$

$\frac{10}{m-2}<0 \quad m-2<0 \to m<2 \quad (m\neq 2, m<2)$

ب) $m+1=-2(m-2) \to m+1=-2m+4$

$\frac{-b}{2a}=-2 \to -\frac{\cancel{2}(m+1)}{\cancel{2}(m-2)}=-2 \to 3m=3$

$m=1$

$\frac{2x^2}{3}-(2\sin\alpha)x+\frac{3}{2}=0$

$4\sin^2\alpha-4\times\frac{2}{3}\times\frac{3}{2}=4\sin^2\alpha-4=4(\sin^2\alpha-1) \to \Delta=-4\cos^2\alpha\leq 0$

$\alpha=\frac{\pi}{2}+k\pi \quad (k\in Z) \qquad x=\frac{-b}{2a}=\frac{3}{2}\sin\alpha$

$\begin{cases} x=\frac{3}{2} & \alpha=\frac{\pi}{2}+2k\pi \\ x=-\frac{3}{2} & \alpha=\frac{3\pi}{2}+2k\pi \end{cases}$