14

سارینا صفدرآبادی   به نام او

۲

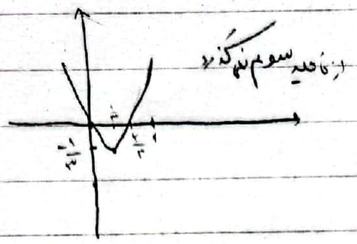
1. الف) $y = 3x^2 - 2x$

$\Delta = 4$ $a > 0 \to \min$

$x = \frac{2 \pm \sqrt{4}}{6} \to \frac{4}{6}, 0$

$x_s = \frac{-b}{2a} = \frac{2}{6}$

$y_s = 3 \times \frac{1}{9} - 2 \times \frac{1}{3} = -\frac{1}{3}$



ب) $y = -x^2 + 4x$

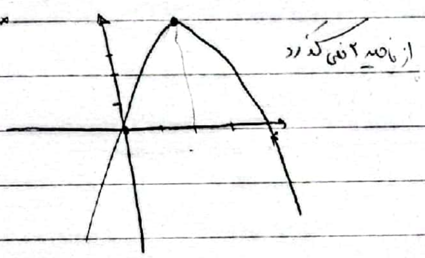
$\Delta = 16$ $a < 0 \to \max$

$x(4 - x) = 0$

0 4

$x_s = \frac{-4}{-2} = 2$

$y_s = 4$



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2. الف) $y = 2x^2 - 5x + 2$

$a > 0 \to \min$

$x_s = \frac{5}{4}$

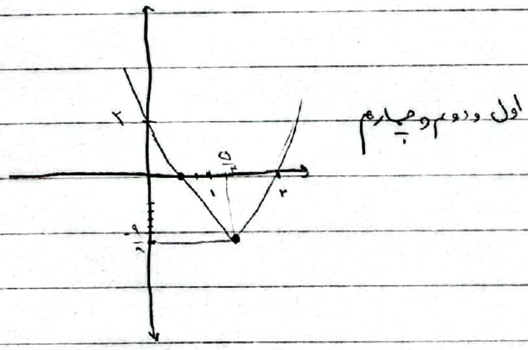
$y_s = 2 \times \frac{25}{16} - 5 \times \frac{5}{4} + 2$

$= \frac{25}{8} - \frac{50}{8} + \frac{16}{8} = -\frac{9}{8}$

$x^2 - 5x + 4$

$(x - 1)(x - 4)$

$\frac{1}{2}$ $\frac{4}{2} = 2$ ریشه‌ها



ب) $y = -x^2 + 4x - 1$

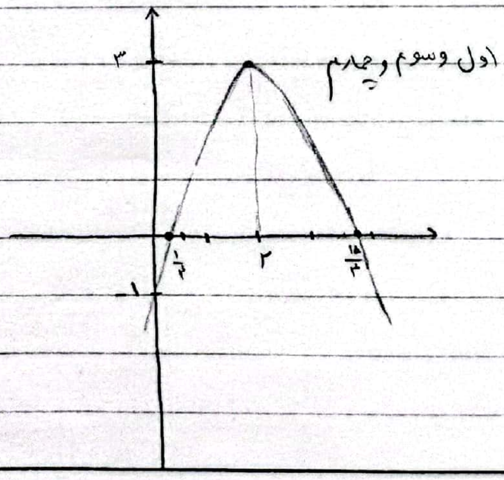
$\Delta = 16 - 4 = 12$ $a < 0 \to \max$

$x = \frac{-4 \pm \sqrt{12}}{-2} \simeq \frac{-4 + 3/5}{-2}, \frac{-4 - 3/5}{-2}$

$\simeq \frac{1}{4}$ و $\frac{15}{4}$

$x_s = \frac{-4}{-2} = 2$

$y_s = -4 + 8 - 1 = 3$



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SUBJECT:

Year: Month: Day:

3- $x^2 - x - 3 = 0$

$S = \frac{1}{1} = 1$ $\quad P = -3$ $\quad$ تفاضل $= \frac{\sqrt{\Delta}}{|a|} = \frac{\sqrt{1 - 4 \times -3}}{1} = \sqrt{13}$ ✓ ریاضیات

الف) $\frac{\alpha + \beta}{\alpha - \beta} = \frac{1}{\sqrt{13}}$ ✓ $\frac{1}{\sqrt{13}}$

ب) $\alpha^2 + \beta^2 = S^2 - 2P = 1 + 6 = 7$

ج) $\alpha^4 + \beta^4 = S^4 - 2PS = 1 - 2 \times -3 \times 1 = 10$

د) $\alpha^3 - \beta^3 = (\alpha - \beta)(\alpha^2 + \beta^2 + \alpha\beta) = \sqrt{13}(7 - 3) = 4\sqrt{13}$ ✓ $\sqrt{13}$ ✓ $4\sqrt{13}$

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حسابان یازدهم

۴

$y=(x-2)(x^2-ax+a)$

این باید ریشه مضاعف داشته باشد
یا
ریشه مضاعفش ۲ داشته باشد

$a=4$

$a^2-4a<0$

	0		4	
+		−		+

$[0,4]$ ← بازه a

۵- $2\alpha^2+\beta^2-4\alpha=7$

$S=\frac{12}{3}=4 \quad 3x^2-12x-a=0$

$2(4\alpha+\frac{a}{3})+4\beta+\frac{a}{3}-4\alpha=7$

$\alpha^2-4\alpha-\frac{a}{3}=0$

$8\alpha+a+4\beta-4\alpha=7$

$\alpha^2-4\alpha+3=0 \quad \alpha^2=4\alpha+\frac{a}{3}$

$(\alpha-1)(\alpha-3)=0 \quad 1 \quad 3$

$\beta^2=4\beta+\frac{a}{3}$

$4(\alpha+\beta)+a=7$

$16+a=7 \quad a=-9 \quad \frac{-9}{3}=-3$

۶- $A(2a+3,a-2)$ $\quad 2a+3\geq 1 \quad 2a\geq -2 \quad a\geq -1$

$B(7-2a,a-2)$ $\quad a-2\geq 1 \quad a\geq 3$ $\quad a=3$

$A(9,1)$ $\quad 7-2a\geq 1 \quad 6\geq 2a \quad 3\geq a$

$B(1,1)$

$\frac{9+1}{2}=5 \quad x_s=5 \quad S(5,3)$

$y=a(x-x_s)^2+y_s$

$y=a(x-5)^2+3 \quad y=-\frac{1}{8}(x-5)^2+3$

$1=16a+3 \quad y=\frac{-25}{8}+\frac{24}{8}$

$-2=16a \quad a=-\frac{1}{8} \quad y=\frac{-1}{8}$

۷- $20\beta^2+20\alpha^2-20\beta=17$ $\quad ax^2-ax-b=0 \quad S=\frac{a}{a}=1$

$20\beta+20\frac{b}{a}+20\alpha+20\frac{b}{a}-20\beta=17$ در صورتی که $a\neq 0$ $\quad x^2-x-\frac{b}{a}=0$

$20(\alpha+\beta)+40\frac{b}{a}=17 \quad \alpha^2-\alpha-\frac{b}{a}=0$

$20+40\frac{b}{a}=17 \quad \alpha^2=\alpha+\frac{b}{a}$

$40\frac{b}{a}=-3 \quad \beta^2=\beta+\frac{b}{a}$

$\frac{b}{a}=\frac{-1}{20} \quad \frac{\sqrt{\Delta}}{|a|}=\frac{\sqrt{a^2-4\times -b\times a}}{|-20b|}=\frac{\sqrt{400b^2-80b^2}}{20b}$

$a=-20b$

$\frac{2\times 8\sqrt{2}}{5\times 4}=\frac{2}{5}\sqrt{2}$

s.a.m

معرفی مثال‌ها

۸- $(-۵,\beta)\quad(۱,\beta)$ (۲)

$x_s=\frac{-۵+۱}{۲}=-۲\qquad y_s=-\frac{۱}{۲}$

$y=a(x-x_s)^۲+y_s$

$y=a(x+۲)^۲-\frac{۱}{۲}\qquad y=\frac{۱}{۲}(x+۲)^۲-\frac{۱}{۲}$

$\frac{۳}{۲}=۴a-\frac{۱}{۲}\qquad \beta=y=\frac{۹}{۲}-\frac{۱}{۲}$

$۲=۴a\qquad a=\frac{۱}{۲}\qquad \beta=۴$

۹- (۲) $x^۲+۶x+a=۰\qquad \alpha<\beta<۰\qquad ۳\alpha^۲+۲\beta^۲=۱۲\sqrt{۲}+۸۵$

$\alpha=\frac{-۶-\sqrt{۳۶-۴a}}{۲}\qquad \alpha^۲+۲(\alpha^۲+\beta^۲)=\alpha^۲$, $S^۲-۲P$

$\beta=\frac{-۶+\sqrt{۳۶-۴a}}{۲}\qquad \alpha^۲+۲(۳۶-۲a)$

$\frac{۳۶+۳۶-۴a+۱۲\sqrt{۳۶-۴a}+۷۲-۴a}{۴}$

$S=-۶\quad P=a$

$۱۸-a+۳\sqrt{۳۶-۴a}+۷۲-۴a$

$۹۰-۵a+۳\sqrt{۳۶-۴a}=۱۲\sqrt{۲}+۸۵$

$-۵a+۳\sqrt{۳۶-۴a}=-۵+۱۲\sqrt{۲}$

if $a=۱$

$۳\sqrt{۳۶-۴}=۱۲\sqrt{۲}$

$\sqrt{۳۲}=\sqrt{۳۲}$ ✓

۱۰- (۲)

$\left(\sqrt{\frac{۱}{\alpha}}+\sqrt{\frac{۱}{\beta}}\right)^۲=\frac{۱}{\alpha}+\frac{۱}{\beta}+۲\sqrt{\frac{۱}{\alpha\beta}}$

$\frac{\alpha+\beta}{\alpha\beta}+۲\sqrt{\frac{۱}{\alpha\beta}}=۵$

$\frac{\alpha+\beta}{\alpha\beta}+۲\sqrt{\frac{۱}{\alpha\beta}}=۲۵$

$S=\frac{m+۱۴}{۳۶}\qquad ۳۶\left(\frac{m+۱۴}{۳۶}\right)+۱۲=۲۵$

$m=-۱$

$P=\frac{۱}{۳۶}\qquad -x^۲+۳x+۲=۰$

$P_۲=\frac{c}{a}=\frac{۲}{-۱}=-۲$

s.a.m