نیلا نرادی - ۳۴

۲۰

۱) ۲

الف) $y=-2x^2-4x+1$

max
$\frac{-b}{2a}=\frac{4}{-4}=-1$

$\frac{-\Delta}{4a}=\frac{16-8}{4\times(-2)}=-1$

ب) $y=-2x^2+3x-5$

min
$\frac{-3}{-4}=\frac{3}{4}$

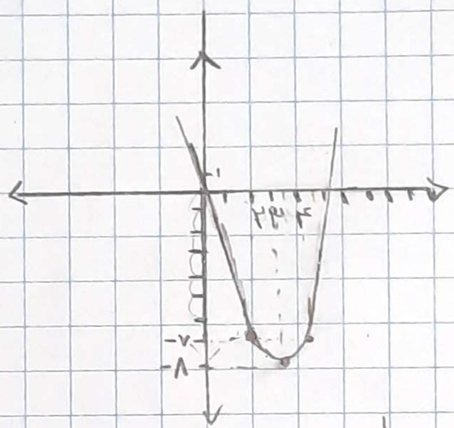
$\frac{9-4\times5\times2}{-8}=\frac{-31}{8}$

۲) ۲

الف) $y=x^2-6x+1$

min
۳
-۸

(۲ , -۷)
(۳ , -۸)
(۴ , -۷)



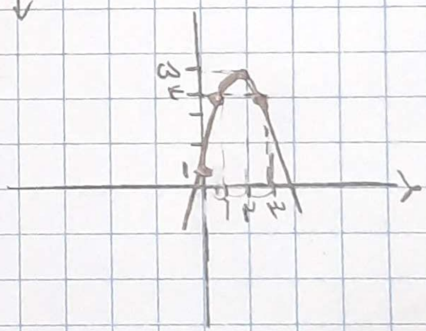
$x=0 \rightarrow y=1$

$y=0 \rightarrow x$

ب) $y=-x^2+4x+1$

max
۲
۵

(۱ , ۴)
(۲ , ۵)
(۳ , ۴)
(۰ , ۱)



۳) ۲

$4x^3+Kx^2-9x-2=0$

$\alpha+\beta+\gamma=\frac{-b}{a}$

$\alpha\beta\gamma=\frac{2}{4} \rightarrow \gamma=\frac{-1}{4}$

$\gamma=\frac{-1}{4}$

$1-\frac{1}{4}=\frac{-K}{4} \rightarrow \frac{3}{4}=\frac{-K}{4}$

$K=-3$

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$x^2 - 3mx + m$

(۴)

(گزینه ۱)

$\alpha + \beta = -\frac{b}{a} = 3m$

$\alpha\beta = \frac{c}{a} = m$

$|\sqrt{\alpha} - \sqrt{\beta}| = 1 \xrightarrow{\text{توان ۲}} \alpha + \beta - 2\sqrt{\alpha\beta} = 1$

$3m - 2\sqrt{m} = 1$

$m = 1$

$2x^2 - mx - m \rightarrow 2x^2 - x - 1$

$\frac{c}{a} = \frac{-1}{2}$

(۲)

$y = 2x^2 - (m+2)x + m = 0 \rightarrow x = 1, \frac{m}{2}$

$a + b + c = 0 \qquad y(0) = m$

$S = \frac{1}{2} \left| m\left(\frac{m}{2} - 1\right) \right|$

$\rightarrow \left| m\left(\frac{m}{2} - 1\right) \right| = \frac{3}{2} \rightarrow |m(m-2)| = 3 \rightarrow m = -1 \rightarrow \frac{m}{2} = \frac{-1}{2}$

$m = 3 \rightarrow \frac{3}{2}$

(۳)

$\frac{-b}{2a}$

$\frac{-\Delta}{4a}$

$\frac{-\Delta}{4\alpha} = \frac{4\alpha^2 - 9}{4\alpha} = \frac{7}{8}$

$28\alpha = 32\alpha^2 - 72$

$32\alpha^2 - 28\alpha - 72$

$8\alpha^2 - 7\alpha - 18 \rightarrow \alpha^2 - 7\alpha - 144$

$(\alpha - 16)(\alpha + 9)$

$2 \leftarrow \frac{16}{8}$ ق ق

$\frac{-9}{8}$ غ ق ق

(۳)

$\Delta = (\alpha + 1)^2 - 4\alpha$

$x = \frac{\alpha + 1 \pm \sqrt{(\alpha+1)^2 - 4\alpha}}{2} = \frac{\alpha + 1 \pm \sqrt{\alpha^2 + 2\alpha + 1 - 4\alpha}}{2}$

$\frac{\alpha + 1 \pm \sqrt{\alpha^2 - 2\alpha + 1}}{2} = \frac{\alpha + 1 \pm (\alpha - 1)}{2}$

$+ \rightarrow \frac{\alpha + 1 + \alpha - 1}{2} = \frac{2\alpha}{2}$

$- \rightarrow \frac{\alpha + 1 - \alpha + 1}{2} = 2$

ریشه‌ها ← $\alpha, 1$

$1, 3 \rightarrow \alpha = 3$

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$$x = \frac{(-b+2) \pm \sqrt{(b+2)^2 - 4(b+1)}}{2}$$

$$(b+2)^2 - 4b - 4 = b^2 + 4b + 4 - 4b - 4 = b^2$$

$$x = \frac{-(b+2) \pm |b|}{2}$$

$-b-2+b = -2 \quad -1$

$-b-2-b = -2-2b$

۲ یا ۰ b و b

۵۰۱ → ۱ × ۳   ۰ - ۳ = (-۳)

جواب ← ۰ یا ۸   ۸ - ۳ = (۵)

۸ - (۲)

$$y = -ax^2 + ax + 2$$

$$\frac{-b}{2a} = \frac{-a}{-2a} = \frac{1}{2}$$

$$\frac{-\Delta}{4a} = \frac{a^2 + 8a}{4a} = \frac{a}{4} + 2$$

$$y = 2bx^2 - bx - 1$$

$x \to \frac{1}{2}$ $\frac{a}{4} + 2 = \frac{b}{2} - \frac{b}{2} - 1$

$y \to \frac{a}{4} + 2$ $a = -12$

رأس سهمی دوم $\frac{1}{4} = x$

$\frac{-b}{8} - 1 = y$

$$\frac{-b}{8} - 1 = \frac{-a}{16} + \frac{4a}{16} + 2$$

$$\frac{-b}{8} - 1 = \frac{3a}{16} + 2$$

$$\frac{-b}{8} = \frac{3a}{16} + 3 \quad (a = -12)$$

$$\frac{-b}{8} = \frac{-9}{4} + 3$$

$b = -6$

$b - a = -6 - (-12) = 6$

۹ - (۲)

$$S = \alpha + \beta = \frac{-4}{25a}$$

$$P = \alpha\beta = \frac{b}{25a}$$

$14\beta = 0 \to P = 0$

$S = 25a^2 = -4$ غ ق ق

$\beta \neq 0 \quad \frac{\alpha\beta}{\beta} = \frac{\frac{\beta}{25a}}{\beta} \to \alpha = \frac{1}{25a}$

$\alpha = \pm\frac{1}{5}$

if $\frac{+1}{5} = \alpha \rightarrow \frac{1}{5} + \beta = \frac{4}{2 \cdot 5 \times \frac{1}{5}} = -\frac{4}{5}$

$\beta > \alpha \quad b = -1$ ✗

if $\frac{-1}{5} = \alpha \quad \frac{-1}{5} + \beta = \frac{-4}{2 \cdot 5 \times \frac{-1}{5}} = \frac{-4}{-5} = \frac{4}{5}$

$\beta = 1 \quad \beta > \alpha$ ✓

$\alpha = \frac{-1}{5} \;,\; \beta = 1$ یکتا مرادی

$y = 25\alpha x^2 + 4x + \beta = 25 \times \frac{-1}{5} x^2 + 4x + 1$

$y = -5x^2 + 4x + 1$

$x = \frac{-4}{2 \times (-5)} = \frac{2}{5}$

$y = -5 \times \frac{4}{25} + 4 \times \frac{2}{5} + 1 = \frac{9}{5}$

$x_0 = \frac{2}{5} > 0$, $y = \frac{9}{5} > 0$ $\} \rightarrow$ راس در ناحیه اول

10

$x^2 - (a^2 + b^2 - 12)x + (a + b - 1) = 0$

$S = a^2 + b^2 - 12 = a + b$

$P = a + b - 1 = ab$

$a^2 + b^2 = (a+b)^2 - 2ab \rightarrow (a+b)^2 - 2(a+b-1) - 12 = a+b$, $a+b = y$

$y^2 - 3y - 10 = 0 \rightarrow (y-5)(y+3) = 0$

$a + b = 5 \rightarrow 6$ ✓

$a + b = -3 \rightarrow$ غ ق ق

Senobar