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(الف) $y = 2x^2 - 4x + 1$ $x_v = \frac{-b}{2a} = \frac{4}{4} = 1$ $y_v = 2 \times 1^2 - 4 \times 1 + 1 = -1$

رأس = (۱، -۱) نوع مینیمم دارد $a > 0$

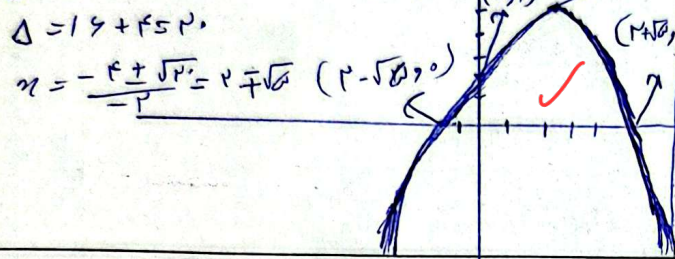
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(ب) $y = -2x^2 + 3x - 0$ رأس = $(\frac{3}{4}, \frac{9}{8})$ نوع ماکسیمم دارد $a < 0$

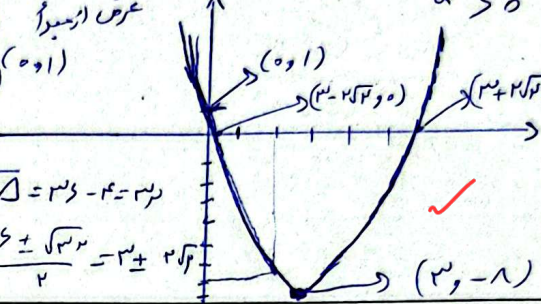
$x_v = \frac{-b}{2a} = \frac{-3}{2 \times -2} = \frac{3}{4}$ $y_v = -2 \times (\frac{3}{4})^2 + 3(\frac{3}{4}) - 0 = \frac{-9}{8} + \frac{9}{4} = \frac{9}{8}$

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$\frac{-4}{2(-1)} = 2 =$ رأس $y_v = 2 \times 2^2 - 4 \times 2 + 1 = 1$
 عرض از مبدا (۰، ۱) $a < 0$ (۲، ۵) رأس



(الف) رأس $(3, -1)$ $\frac{3}{2} = 3$ عرض از مبدا



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$\frac{-b}{a} = \alpha + \beta + \gamma = \frac{-14}{4}$

$\alpha\beta\gamma = \frac{7}{4} \parallel -\alpha\beta\gamma = -(-2) \times \gamma = \frac{1}{4} \Rightarrow \gamma = -\frac{1}{4}$

$4(-\frac{1}{4}) + 14(\frac{1}{4}) + \frac{9}{4} - 2 = 0 \Rightarrow k = \frac{13}{4}$

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

$\alpha + \beta = 2m$

$\alpha\beta = m$

$(\sqrt{\alpha} - \sqrt{\beta}) = 1$

$(\sqrt{\alpha} - \sqrt{\beta})^2 = 1$

$\alpha + \beta - 2\sqrt{\alpha\beta} = 1 \Rightarrow m_1 = 1 \quad m_2 = \frac{1}{9}$

$2m - 1 = 2\sqrt{4m}$
 $(2m - 1)^2 = 4m$
 $4m^2 - 4m + 1 = 4m$
 $4m^2 - 8m + 1 = 0$
 $\Delta = 64 - 16 = 48$
 $m = \frac{8 \pm \sqrt{48}}{8} = \frac{2 \pm \sqrt{3}}{2}$

$(\sqrt{\alpha} - \sqrt{\beta}) = 2m - 2\sqrt{m} = 1$

~~$m = \frac{1}{9} \Rightarrow 2(\frac{1}{9}) - 2\sqrt{\frac{1}{9}} = \frac{2}{9} - \frac{2}{3} = -\frac{4}{9}$~~

$m = 1$

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

$\alpha\beta = -\frac{m}{2}$

$\alpha\beta = \frac{1}{2}$

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$2x^2 - (m+2)x + m = 0 \Rightarrow a+b+c=0$

$\delta = \frac{1}{2} |m(\frac{m}{2} - 1)| = |m(\frac{m}{2} - 1)| = \frac{m}{2}$

$|m(m-2)| = 2 \Rightarrow \begin{cases} m = -1 \Rightarrow \frac{m}{2} = -\frac{1}{2} \\ m = 2 \Rightarrow \frac{m}{2} = 1 \end{cases}$

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$y = ax^2 + px + a \quad a > 0$

$x_0 \text{ بزرگتر از } -\frac{b}{2a} = -\frac{p}{2a} \quad a - \frac{q}{2a} = \frac{v}{1} \quad \wedge a - \frac{11}{2} = v$

$\Delta x^2 - 11 = v \Delta \quad \wedge \Delta^2 - v \Delta - 11 = 0 \quad \Delta = 11 + 0 \pm \sqrt{121} = 22$

$\alpha = \frac{v \pm 22}{19}$

$a_1 = \frac{11}{19} - 7$ $a_2 = -\frac{11}{19} = -\frac{q}{2a}$

✓ مقادیر صحیح و صحیح دارد

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$x^2 - (a+1)x + a = 0 \quad a+b+c=0 \rightarrow \begin{cases} x_1 = 1 \\ x_2 = a = 3 \end{cases}$ فرد متساوی!

$x^2 - (3(3)+1)x + b = 0 \rightarrow x^2 - 10x + b = 0 \quad S=10 \rightarrow \begin{cases} x_1 = 4 \\ x_2 = 6 \end{cases}$ زوج متساوی!

$(4 \times 4) - (1 \times 3) = 21$

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$y = ax^2 + px + r$ $y = rbx^2 - bx - 1$

$\delta(\frac{1}{r}, \frac{a^2+1a}{ra})$ $\delta(\frac{1}{r}, \frac{b^2+1b}{-rb})$

$rb(\frac{1}{r}) - b(\frac{1}{r}) - 1 = \frac{a}{r} + r \Rightarrow \frac{a}{r} = -r$

$-\frac{a}{19} + \frac{a}{r} + r = -\frac{b}{1} - 1 \Rightarrow \frac{11}{19} = -\frac{b}{1} \Rightarrow b = -11$

$-9 - (-11) = 2$

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$\alpha\beta = \frac{\beta}{r\alpha} \Rightarrow \alpha^2 = \frac{1}{r\alpha} \Rightarrow \alpha = \pm \frac{1}{\alpha}$

$x = \alpha: \alpha^2 + r\alpha + \frac{1}{r\alpha} + r\alpha + \beta = 0 \Rightarrow \alpha^2 + \beta = 0 \Rightarrow \beta = -\alpha^2$

$\beta > \alpha \Rightarrow \alpha = -\frac{1}{\alpha}$ $\beta = 1$

$\frac{-1}{2} + 1 = 0, 1/2 \quad y(0, 1/2) = -\alpha(0, 1/2)^2 + r(0, 1/2) + 1 = 1/4$

$(0, 1/2, 1/4)$ ✓

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

$P \Rightarrow a+b-1 = ab$

$a^2+b^2 = (a+b)^2 - 2ab \Rightarrow \underbrace{(a+b)^2}_{y^2} - 2 \underbrace{(a+b-1)}_y - 12 = a+b$

$y^2 - 2y - 13 = 0 \Rightarrow (y-5)(y+3) = 0$

$\begin{cases} a+b = 5 \\ a+b = -3 \end{cases}$ چون اعداد طبیعی اند پس مجموع آنها 3 نمی باشد

نقطه طبیعی است

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