نام و نام خانوادگی: علی پورعابدین شماره: ۲۴ کلاس: دهم پسرانه A ۱۷/۵

الف) (۲)

$Next = \frac{-b}{2a} = \frac{-4}{4} = 1$ مینیمم min

$yext = 2(1)^2 - 4(1) + 1 = 2 - 4 + 1 = -1$

$Ext = (1, -1)$ ✓

ب) ماکسیمم max

$xext = \frac{-b}{2a} = \frac{-3}{-6} = \frac{3}{4}$

$yext = -2 \times \frac{9}{16} + 3 \times \frac{3}{4} - 5 = \frac{-9}{8} + \frac{9}{4} - 5 = \frac{-9+18-40}{8}$

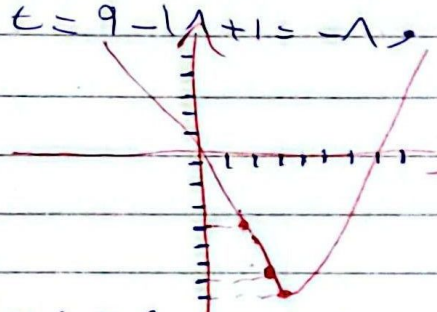
$= \frac{-31}{8}$

$Ext = (\frac{3}{4}, -\frac{31}{8})$ ✓

۲-الف) (۲)

$xext = \frac{4}{2} = 2$ $yext = 9 - 18 + 1 = -8$

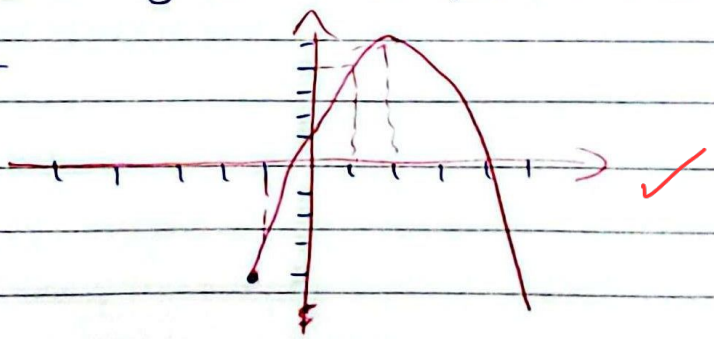
x	0	1	-1	2
y	1	-4	8	-7



ب) (۲)

$xext = \frac{-4}{-2} = 2$ $yext = -4 + 8 + 1 = 5$

x	0	1	-1	3
y	1	4	-4	-5



$x^2 - 6x + p \xrightarrow[\alpha\beta = -2]{\alpha + \beta = 1} x^2 - x - 2 = 0 \Rightarrow x^2 - x - 2$ (۲)

$-2 = 4x^2 + 4kx^2 - 9x^2 - 2 \Rightarrow 4x^2 + 4kx^2 - x^2 - 9x + x - 2 + 2 = 0$

$\Rightarrow 4x^2 + (4k-1)x^2 - 8x = 0 \quad x(4x^2 + (4k-1)x - 8) = 0$

$\Rightarrow 4x^2 + (4k-1)x - 8 = 0 \quad \Delta = 0 \Rightarrow (4k-1)^2 + 128 = 0$

$\Rightarrow 16k^2 - 8k + 1 + 128 = 0 \Rightarrow 16k^2 - 8k + 129 = 0$

$k = -3$ ✓

ب- $(2+5)^2 - (2-5)^2 = 1 \quad |2-5| = m \quad 2 \times 5 = 2 + 5$ (۲)

$4 \times 5 = 9m^2 \quad m = \frac{2 \pm \sqrt{13}}{9} \quad \frac{c}{a} = \frac{-m}{2}$

$\frac{-m}{2} = \frac{1}{2} \times \frac{2 \pm \sqrt{13}}{9} = \frac{-4 \pm \sqrt{13}}{18}$

$-\frac{1}{2}$ ✓

$x = \frac{(m+2) \pm \sqrt{(m+2)^2 - 8m}}{2} = \frac{(m+2) \pm \sqrt{m^2 - 4m + 4}}{2}$ (۲)

ارتفاع $= |y_{min}|$ $\quad x_1 = 1 \quad x_2 = \frac{m}{2}$

$\frac{1}{2} \times |1 - \frac{m}{2}| \times m = \frac{27}{16} \Rightarrow m - \frac{m^2}{2} = \frac{27}{16} \Rightarrow (m-2)(m+1) = 0$

$y = \frac{m^2}{2} - m \times \frac{m}{2} + 1 = \frac{m^2}{2} - \frac{m^2}{2} + 1$

$m = -1 \rightarrow -\frac{1}{2}$ طول رأس ✓ $\quad m = 2 \rightarrow \frac{2}{2}$ طول رأس ✓

$ax^2 + 2x + a - \frac{7}{8} = 0$ ضرب در ۸ $\Rightarrow 8ax^2 + 16x + 8a - 7 = 0$ (۱)

$a = 0 \rightarrow 16x - 7 = 0$ $\quad a \neq 0$ $\quad \Delta = 16^2 - 4(8a)(8a-7)$

$\div 32 \Rightarrow 8a^2 - 16a + 14a - 7 \geq 0 \Rightarrow 8a^2 - 2a - 7 \geq 0$

$a = \frac{2 \pm \sqrt{4 + 224}}{16} = \frac{2 \pm 15}{16}$ تابع به ضابطه $y = \frac{7}{8}$ یعنی $\Delta = 0$ است

$a_1 = \frac{17}{16} = 1 \quad a_2 = \frac{-13}{16} = -\frac{13}{16}$

$a \in \{-1, 0, 1, 2\}$ ؛ $a \in [-\frac{13}{16}, 1]$

$\alpha = \beta + 2$, $x^2 - (a+1)x + a = 0 \Rightarrow \alpha + \beta = 7$

$= \frac{\sqrt{\Delta}}{|a|} \Rightarrow \sqrt{a^2 + 1 + 2a - 4a} = \sqrt{a^2 - 2a + 1} = 1$ (۴)

$\sqrt{(a-1)^2} = a - 1 = 2 \quad a = 3$ جایگذاری معادله درجه دوم $x^2 - 15x + b = 0$

$\alpha' = \beta' + 2 \Rightarrow \alpha' - \beta' = \frac{\sqrt{\Delta}}{|a|} \Rightarrow \sqrt{100 - 4b} = 6$

$36 = 100 - 4b \Rightarrow b = 16$ $\quad \frac{c}{a} = 3 \times 9 = 27$ $\quad \frac{1}{\alpha} + \frac{1}{\beta} = \frac{\alpha + \beta}{\alpha\beta} = \frac{15}{16}$ رابطه ضرب و جمع ریشه‌ها

$27 - 16 = 11$ ✓

۷- گزینه ۵

$y = -a(\frac{1}{2})^2 + a(\frac{1}{2}) + 2 = \frac{a}{4} + 2$

$y = 2bx^2 - bx - 1 \quad y = 2b(\frac{1}{2})^2 - b(\frac{1}{2}) - 1 = \frac{b}{2} - \frac{b}{2} - 1 = -1$

$\frac{a}{4} + 2 = -1 \Rightarrow \frac{a}{4} = -3 \Rightarrow a = -12$ رأس سهمی اول

$2b(\frac{1}{4})^2 - b(\frac{1}{4}) - 1 = \frac{b}{8} - \frac{b}{4} - 1 = -\frac{3}{8}$

$-\frac{b}{8} = \frac{5}{8} \Rightarrow b = -5$

$a + 2b = -12 - 10 = -22$

$2a + 4b = -44$ $\quad -2a - 3b = 34$ $\quad -b = -10$

$a = -\frac{66}{5}$ $\quad b - a = 10 + \frac{66}{5} = \frac{116}{5}$

$b - a = 24$

۹- $\alpha \times \beta = \frac{\beta}{2a^2}$ $\quad \beta \neq 0$ $\quad \alpha = \frac{1}{2a^2}$ (۲)

$\alpha + \beta = -\frac{4}{2a^2}$ $\quad \frac{1}{2a^2} + \beta = -\frac{4}{2a^2}$

$\frac{1}{2a^2} + \beta = -\frac{4}{2a^2}$ $\quad \beta = -\frac{1}{3a}$ $\quad a < 0$

$x = -\frac{4}{3a} = \frac{-2}{2a^2}$ $\quad x = -\frac{1}{2a^2} > 0$

$y = -\frac{4}{2a^2} + \beta = -\frac{4}{2a^2} - \frac{1}{3a} = -\frac{9}{6a^2}$

$x > 0$ $\quad y > 0$ پس ✓ (در ناحیه ۱)

۱۰- $a + b = a^2 + b^2 - 12 - 2ab$ (۲)

فرض $S = a+b$ $\quad P = ab$ $\quad -12 < P = ab$ $\quad S = S^2 - 2P$

$2(S-1) = S^2 - S - 12$ $\quad S^2 - 3S - 10 = 0$

$S = 5$ ✓ $\quad S = -2$ ✗ $\quad S = a+b > 0$

$a+b = 5$ $\quad ab = 4$ $\quad t^2 - 5t + 4 = 0$

$t = 1, 4$ $\quad a = 1$ $\quad b = 4$ یا برعکس

$x^2 - 5x + 4 = 0$ $\quad a+b = 1+4 = 5$ ✓

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۶ کمترین مقدار زمانی است که $a > 0$ باشد!

$x_S = \frac{-3}{2a}$

$y = a(-\frac{3}{2a})^2 + 3(-\frac{3}{2a}) + a = \frac{7}{8} \rightarrow 8a^2 - 7a - 18 = 0$

$\frac{c}{a} < 0$ یعنی دو ریشه مختلف العلامت داریم

که فقط $a > 0$ قابل قبول است یعنی گزینه ۲ جواب!

$S_1\left(\frac{1}{2}, \frac{a^2+8a}{4a}\right)$ $S_2\left(\frac{1}{4}, \frac{b^2+8b}{-8b}\right)$ -8

$$\frac{a}{4}+2=\frac{b}{2}-\frac{b}{2}-1 \rightarrow a=-12$$

$$-\frac{a}{14}+\frac{a}{4}+2=-\frac{b}{8}-1 \rightarrow b=-4$$

$$b-a=\boxed{4}$$