بلقیس بانوری

۱۹٫۵

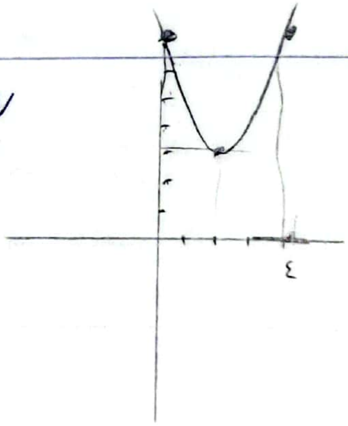
مقطع: یازدهم دختر A

①

الف) $y = x^2 - 4x + 7$

$ext / \frac{4}{2}$ $4-8+7=3$

x	۰	۲	۴
y	۷	۳	۷

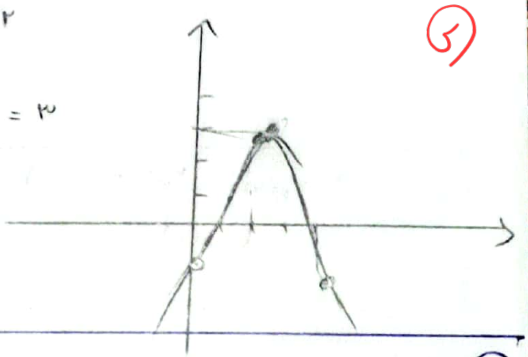


ب) $y = -x^2 + 4x - 1$

$ext / \frac{-4}{-2}=2$

$-4+8-1=3$

x	۰	۲	۴
y	-1	۳	-1



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②

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

الف) ۲ ریشه متمایز:

$\Delta>0 \to (m+1)^2-8(\frac{1}{2}m+2) \to m^2+1+2m-4m-16 \to m^2-2m-15$

$(m-5)(m+3)$

$m<-3$ یا $m>5$

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ب) ریشه مضاعف:

$\Delta=0 \to (m+1)^2-8(\frac{1}{2}m+2)=0 \to m^2+1+2m-4m-16=0$ $m^2-2m-15$ $\boxed{5, -3}$

$(m-5)(m+3)$

ج) فاقد ریشه حقیقی:

$\Delta<0 \to (m+1)^2-8(\frac{1}{2}m+2)<0 \to m^2-2m-15 \to -3<m<5$

د) ریشه‌دار

$m\leq -3$ یا $m\geq 5$

③

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

الف) همواره برقرار

$\Delta>0 \to (2m+2)^2-4(m-2)(10)>0 \to 4m^2-32m+84>0 \to$ $m^2-8m+21>0$

$S<0 \to \frac{2m+2}{m-2}<0$ $(-1,2)$

$P>0 \to \frac{10}{m-2}$ $(2,+\infty)$

$(m\to\varnothing)$

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ب) $S<0 \to \frac{2m+2}{m-2}<0 \to (-1,2)$

$P<0 \to \frac{10}{m-2}<0 \to (-\infty,2)$

$\boxed{m=(-1,2)}$

④

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

الف) $P<0 \to \frac{10}{m-2}<0$ $m<2$

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ب) $\frac{2m+2}{2m-4}=-2 \to \frac{m+1}{m-2}=-2 \to m+1=-2m+4$

$3m=3 \to \boxed{m=\frac{3}{3}}$

(5)

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

$\Delta \geq 0 \to 4\sin^2\alpha - \cancel{4}\times\frac{2}{3} \geq 0 \to 4\sin^2\alpha - 4 \geq 0 \to \sin^2 = 1 \to \sin = \pm 1$ — 2

$\sin x = +1 \to \frac{2x^2}{3} - 2x + \frac{3}{2} = 0 \to 4x^2 - 12x + 9$

$x^2 - 12x + 36 \to (x-6)^2 = \frac{6}{4}$ ✓ 1

$\sin x = -1 \to \left(\frac{2x^2}{3} + 2x + \frac{3}{2}\right)6 \to 4x^2 + 12x + 9 \to (x+6)^2 = 0 \to \frac{-3}{2}$ ✗

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(6)

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

$(3x^2-2x-1) \div (x-1) = 3x+1 \qquad (2x^2-3x-5) \div (x+1) = 2x-5$ — 2

$$\frac{(x-1)(3x+1)\cancel{(x+1)}(2x-5)}{(1-x)\cancel{(1+x)}} \to (-3x-1)(2x-5) \Rightarrow -6x^2 + 13x + 5$$

ext $\frac{+13}{+12}$ $\frac{2\wedge 9}{24}$

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(7)

$mx^2 - (m+2)x - 2 = 0 \qquad 3(\alpha+\beta) - 5\alpha\beta = 7 \qquad \boxed{4x^2 - 6x - 2}$ — 2

$\frac{3(m+2)}{m} + \frac{10}{m} = 7 \longrightarrow \boxed{m = 4} \qquad S = \frac{3}{2} \quad P = -\frac{1}{2}$

$\alpha^2 + \beta^2 \Rightarrow S^2 - 2P \Rightarrow \frac{9}{4} + 1 \to \frac{13}{4}$

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(8)

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

$\beta^5 = 479\beta - 210 \qquad \alpha + \beta = 5 \to \alpha = 5 - \beta$ — 2

$\beta^2 = 5\beta - 2 \to \beta^3 = 5(5\beta - 2) \to \beta^5 = 479\beta - 210$

$$4\alpha + \beta^5 \Rightarrow \frac{4(5-\beta) + (479\beta - 210)}{25\beta - 10} = \frac{95\beta - 38}{5\beta - 2} \Rightarrow \frac{19(5\beta-2)}{5\beta-2} = 19$$

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(9)

$y_1 = ax^2 + bx + c$

$y_2 = 2x + 10 \Rightarrow \frac{2}{14} \; \frac{-3}{4}$

$4 = 9a - 3b + c$

$14 = 4a + 2b + c \Rightarrow \begin{cases} 3a - b = 0 \\ 2a + b = 5 \end{cases} \to \boxed{b = 3} \; \boxed{a = 1}$ — 2

$y = x^2 + 3x + 4 \qquad$ ext $-1/5$

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(10)

$y = 2x^2 + (m+1)x + m + 6 \xrightarrow{\text{نیمساز ربع اول}} \cancel{y} = 2x^2 + \cancel{x} + mx + m + 6$ — 1/5

$\Delta = 0 \to (m)^2 - 8(m+6) = 0 \to m^2 - 8m - 48 \to (m-12)(m+4)$

12 ✗ $\qquad$ −4 ✓