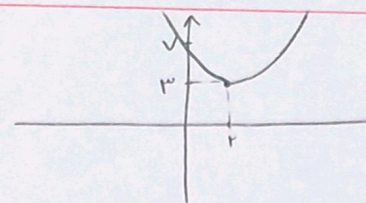


۲۰

سوال ۱

الف) $y = x^2 - 4x + 7$

$$\begin{array}{c|cc} & 0 & 2 \\ \hline & 7 & 3 \end{array}$$

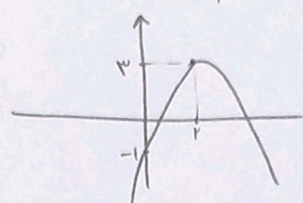


ext $\begin{cases} x = -\frac{b}{2a} = \frac{4}{2} = 2 \\ y \rightarrow 2^2 - 4(2) + 7 = 3 \end{cases}$

۵

ب) $y = -x^2 + 4x - 1$

$$\begin{array}{c|cc} & 0 & 2 \\ \hline & -1 & 3 \end{array}$$



ext $\begin{cases} x = -\frac{b}{2a} = \frac{-4}{-2} = 2 \\ y = -2^2 + 4(2) - 1 = 3 \end{cases}$

سوال ۱۲

$2x^2 + (m+1)x + \frac{1}{4}m + 2 = 0$

الف) معادله درجه دوم متناظر $\rightarrow \Delta > 0 \rightarrow (m+1)^2 - 4(2)(\frac{1}{4}m + 2) = m^2 + 2m + 1 - 4m - 16 = m^2 - 2m - 15 = (m-5)(m+3) \Rightarrow m = 5, -3$

$$\begin{array}{c|cc} & -3 & 5 \\ \hline & + & - \end{array}$$

$\Rightarrow (-\infty, -3) \cup (5, +\infty)$

۵

ب) معادله یک درجه متناظر $\rightarrow \Delta = 0 \rightarrow (m+1)^2 - 4(2)(\frac{1}{4}m + 2) = m^2 - 2m - 15 = (m-5)(m+3) \Rightarrow \{-3, 5\}$

$$\begin{array}{c|cc} & -3 & 5 \\ \hline & + & - \end{array}$$

ج) معادله نامعوضه حقیقی $\rightarrow \Delta < 0 \rightarrow (m+1)^2 - 4(2)(\frac{1}{4}m + 2) = m^2 - 2m - 15 = (m-5)(m+3) \Rightarrow (-3, 5)$

$$\begin{array}{c|cc} & -3 & 5 \\ \hline & + & - \end{array}$$

د) معادله دارای ریشه $\rightarrow \Delta \geq 0 \rightarrow (m+1)^2 - 4(2)(\frac{1}{4}m + 2) = m^2 - 2m - 15 = (m-5)(m+3) \Rightarrow (-\infty, -3] \cup [5, +\infty)$

$$\begin{array}{c|cc} & -3 & 5 \\ \hline & + & - \end{array}$$

سوال ۳

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

الف) محور مختصات را در دو نقطه تقسیم طولی $\rightarrow \Delta = (2(m+1))^2 - 4(m-2)(10) = 4(m^2 + 2m + 1) - 40(m-2) = 4m^2 + 8m + 4 - 40m + 80 = 4m^2 - 32m + 84 = 4(m^2 - 8m + 21)$

$\rightarrow \frac{2(m+1)}{m-2} < 0 \Rightarrow \begin{array}{c|cc} & -1 & 2 \\ \hline & + & - \end{array}, \frac{10}{m-2} > 0 \rightarrow m > 2 \Rightarrow \emptyset$

۵

ب) درجه اولی و خطی $\rightarrow \Delta < 0 \Rightarrow \frac{10}{m-2} < 0 \rightarrow m < 2 \Rightarrow (-1, 2)$

$$\begin{array}{c|cc} & -1 & 2 \\ \hline & + & - \end{array}$$

سوال ۴

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

الف) عبور از نقطه $\Rightarrow$ درجه اولی و خطی $\Rightarrow \frac{10}{m-2} < 0 \rightarrow m-2 < 0 \rightarrow m < 2 \Rightarrow (-\infty, 2)$

$$\begin{array}{c|cc} & -\infty & 2 \\ \hline & + & - \end{array}$$

۵

ب) محور تقاطع $\rightarrow \frac{-b}{2a} = -2 \rightarrow \frac{2m+1}{2(m-2)} = -2 \rightarrow \frac{m+1}{m-2} = -1 \rightarrow m+1 = -m+2 \rightarrow 2m = 1 \rightarrow m = \frac{1}{2}$

$\frac{2x^2}{3} - (2\sin a)x + \frac{3}{4} = 0$

$\Rightarrow$ دارای ریشه حقیقی

$\frac{2\sin a}{\frac{2}{3}} = \frac{3}{4} + \frac{3}{4} \rightarrow \frac{3}{4} \times 2\sin a = 2 \times \frac{3}{4} \rightarrow \sin a = 1 \rightarrow a = 90^\circ$

۵

$P = \frac{\frac{3}{4}}{\frac{1}{3}} \rightarrow n = \frac{3}{4}$

$$y = \frac{(2n^2 - 2n - 1)(2n^2 - 2n - 2)}{1 - n^2} \quad x \neq 1, -1 = \frac{(2n+1)(n-1)(2n-2)(n+1)}{(1-n)(1+n)} = -(2n+1)(2n-2) =$$

$$= -4n^2 + 4n + 2 \rightarrow y = \frac{-\Delta}{FQ} = \frac{-(199+12)}{25} = \frac{-211}{25}$$

مسئله ۱۰
مسئله ۱۱
مسئله ۱۲

$$mx^2 - (m+2)x - 2 = 0 \quad 25 = 2p + V \rightarrow \frac{m+2}{m} \times 25 = 2 \left(\frac{-2}{m} \right) + V \rightarrow \frac{2m+4}{m} = \frac{-10}{m} + V$$

$$\rightarrow \frac{2m+4}{m} = \frac{-10+Vm}{m} \rightarrow 2m+4 = -10+Vm \rightarrow 4m=14 \rightarrow m=4$$

$$S^2 - 2P = \frac{9}{4} + 1 = \frac{13}{4}$$

$$x^2 - 2x + 2 = 0 \quad \frac{2a+B^2}{2B^2} = \frac{2a}{2B^2} + \frac{B^2}{2B^2} =$$

$$a+b=2 \quad ab=2 \rightarrow a = \frac{2}{b} \rightarrow a^2 = \frac{4}{b^2}$$

$$a^2 + B^2 = \frac{4}{b^2} - \frac{2SP}{b^2} = 9a$$

$$\frac{4}{b^2} + \frac{B^2}{a} = \frac{1}{a} \left(\frac{4}{B^2} + B^2 \right) = \frac{1}{a} (a^2 + B^2) = 19$$

$$y_1 = ax^2 + bx + c \quad y_2 = 2x + 10$$

$$2 \text{ نقطه } \rightarrow a(2)^2 + b(2) + c = 2(2) + 10 \rightarrow 4a + 2b + c = 14$$

$$3 \text{ نقطه } \rightarrow a(-3)^2 + b(-3) + c = 2(-3) + 10 \rightarrow 9a - 3b + c = 4$$

$$4 \text{ نقطه } \rightarrow c = 4 \rightarrow \begin{cases} 4a + 2b + c = 14 & c=4 \\ 9a - 3b + c = 4 & c=4 \end{cases} \rightarrow \begin{cases} 4a + 2b + 4 = 14 \\ 9a - 3b + 4 = 4 \end{cases} \rightarrow \begin{cases} 4a + 2b = 10 \\ 9a - 3b = 0 \end{cases}$$

$$4a + 2b = 10 \quad a = \frac{1}{2}b \rightarrow 4\left(\frac{1}{2}b\right) + 2b = 10 \rightarrow 2b + 2b = 10 \rightarrow 4b = 10 \rightarrow b = \frac{5}{2} \rightarrow a = \frac{1}{2}b = \frac{5}{4}$$

$$\text{نسبت } \rightarrow \frac{b}{2a} = \frac{5}{2} \cdot \frac{4}{5} = 2$$

$$y = 2x^2 + (m+1)x + m+4$$

$$\frac{-b}{2a} > 0 \rightarrow \frac{-(m+1)}{2(2)} > 0 \rightarrow m+1 < 0 \rightarrow m < -1$$

$$\Delta = m^2 - 4(m+4) = 0 \rightarrow m^2 - 4m - 16 = 0 \rightarrow (m-12)(m+4) = 0$$

مسئله ۱۰

مسئله ۱۱

مسئله ۱۲