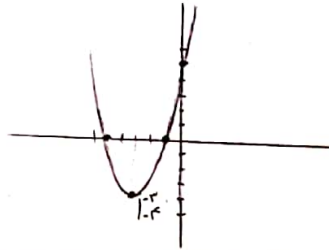


پاسخنامه تشریحی تکلیف شماره کلاس (تیم) (تاریخ)

$$\text{Min} \left| \frac{-b}{2a} \right| = \left| \frac{-(4)}{2} \right| = |-2|$$



الف) چون $a > 0$ است ————— تابع نقطهٔ انحنای کمینه است ————— Min

ب) $a > 0$ یعنی از چپ به راست

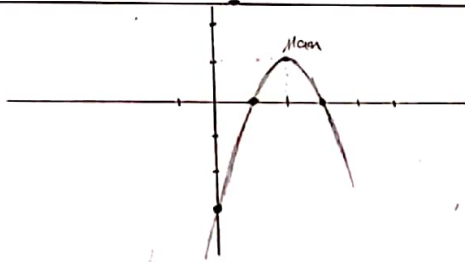
$$(n+1)(n+5) = n^2 + 4n + 5$$

تابع: $y = n^2 + 4n + 5$

$$\Delta = 16 - 20 = -4 < 0$$

پس هیچگاه $y = 0$ نمی‌شود.

$$\text{Min} \left| \frac{-b}{2a} \right| = |-2|$$



الف) $a < 0$ است

$$\text{Max} \left| \frac{-b}{2a} \right| = |-2| \Leftarrow \text{Max} \left| \frac{-b}{2a} \right| = |-2|$$

ب) $a < 0$ یعنی از چپ به راست

$$-n^2 + 4n - 3 = -(n^2 - 4n + 3)$$

تابع ساده: $y = -(n^2 - 4n + 3)$

$$= -(n-1)(n-3) \rightarrow - (n-1)(n-3) \leq 0$$

$$\Rightarrow \begin{cases} n-1 \leq 0 \rightarrow n \leq 1 \\ n-3 \leq 0 \rightarrow n \leq 3 \end{cases}$$

پس $n \leq 1$ و $n \leq 3$ را داریم.

الف) $a \in (-\infty, \frac{9}{1})$

الف) $\Delta > 0 \rightarrow b^2 - 4ac > 0 \rightarrow b^2 > 4ac \rightarrow 9 > 4a \rightarrow \frac{9}{4} > a$

ب) $\Delta = 0 \rightarrow b^2 - 4ac = 0 \rightarrow b^2 = 4ac \rightarrow 9 = 4a \rightarrow a = \frac{9}{4}$

ج) $a \in (\frac{9}{4}, +\infty)$

ج) $\Delta < 0 \rightarrow b^2 - 4ac < 0 \rightarrow b^2 < 4ac \rightarrow 9 < 4a \rightarrow \frac{9}{4} < a$

د) (اینجا باید دقت کرد) چون الف و ب است

الف) $n^2 - 2n - 1 = 0 \xrightarrow{+2} n^2 - 2n + 1 = 2 \rightarrow (n-1)^2 = 2 \rightarrow n-1 = \pm\sqrt{2} \Rightarrow \begin{cases} n = 1+\sqrt{2} \\ n = 1-\sqrt{2} \end{cases}$

ب) $n^2 - n - 1 = 0 \xrightarrow{+\frac{1}{4}} n^2 - n + \frac{1}{4} = \frac{5}{4} \rightarrow (n - \frac{1}{2})^2 = \frac{5}{4} \rightarrow n - \frac{1}{2} = \pm\sqrt{\frac{5}{4}} \Rightarrow \begin{cases} n = \frac{1+\sqrt{5}}{2} \\ n = \frac{1-\sqrt{5}}{2} \end{cases}$

الف) $n^2 - 2n - 1 = 0 \xrightarrow{a=1, b=-2, c=-1} \Delta = b^2 - 4ac = 4 + 4 = 8 \rightarrow \begin{cases} n = \frac{-b+\sqrt{\Delta}}{2a} = \frac{2+\sqrt{8}}{2} = 1+\sqrt{2} \\ n = \frac{-b-\sqrt{\Delta}}{2a} = \frac{2-\sqrt{8}}{2} = 1-\sqrt{2} \end{cases}$

ب) $n^2 + n - 4 = 0 \xrightarrow{a=1, b=1, c=-4} \Delta = b^2 - 4ac = 1 + 16 = 17 \rightarrow \begin{cases} n = \frac{-b+\sqrt{\Delta}}{2a} = \frac{-1+\sqrt{17}}{2} \\ n = \frac{-b-\sqrt{\Delta}}{2a} = \frac{-1-\sqrt{17}}{2} \end{cases}$

$$a) m^2 - 11m + 18 = 0 \rightarrow (m-2)(m-9) = 0 \Rightarrow \begin{cases} m=2 \\ m=9 \end{cases}$$

3

$$b) m^2 + 3m - 18 = 0 \rightarrow (m+6)(m-3) = 0 \Rightarrow \begin{cases} m=-6 \\ m=3 \end{cases}$$

$$الف) 2m^2 - 12m + 15 = 0 \rightarrow m^2 - 6m + 7.5 = 0 \rightarrow (m-3)(m-4.5) = 0 \Rightarrow \begin{cases} m=3 \\ m=4.5 \end{cases}$$

3

$$ب) 3m^2 - 10m + 7 = 0 \rightarrow m^2 - 10m + 21 = 0 \rightarrow (m-3)(m-7) = 0 \Rightarrow \begin{cases} m=3 \\ m=7 \end{cases}$$

4

$$الف) 2m^2 - 5m + 3 = 0 \rightarrow a+b+c=0 \rightarrow \begin{cases} a=1 \\ a=\frac{c}{a} = \frac{3}{2} \end{cases}$$

$$ب) 2m^2 + 5m + 3 = 0 \rightarrow a+c=b \rightarrow \begin{cases} a=-1 \\ a=\frac{-c}{a} = \frac{-3}{2} \end{cases}$$

3

$$ج) 2m^2 - 5m + 1 = 0 \rightarrow a=2, b=-5, c=1 \rightarrow \Delta = b^2 - 4ac = 25 - 4 = 21 \Rightarrow \begin{cases} m = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{5 \pm \sqrt{21}}{4} \\ m = \frac{-b - \sqrt{\Delta}}{2a} = \frac{5 - \sqrt{21}}{4} \end{cases}$$

$$د) 2m^2 + 5m + 9 = 0 \rightarrow a=2, b=5, c=9 \rightarrow \Delta = b^2 - 4ac = 25 - 72 = -47 < 0 \Rightarrow \text{لا يوجد جواب حقيقي}$$

$$S = 2 \rightarrow -\left(\frac{-b}{a}\right) = -3 : 10 \rightarrow \frac{20}{10} \rightarrow m^2 - 3m - 2 = 0 \rightarrow \Delta = b^2 - 4ac = 9 + 8 = 17 \Rightarrow \begin{cases} m = \frac{3 \pm \sqrt{17}}{2} \\ m = \frac{3 - \sqrt{17}}{2} \end{cases}$$

3

$$P = -2 \rightarrow m^2 - 3m - 2 = 0 \rightarrow \left(\frac{3 \pm \sqrt{17}}{2}\right) \left(\frac{3 - \sqrt{17}}{2}\right) = \frac{9 - 17}{4} = -2$$

9

$$الف) S^2 - 2P = (3)^2 - 2(-2) = 9 + 4 = 13$$

$$ب) S^3 - 3SP = (3)^3 - 3(3)(-2) = 27 + 18 = 45$$

$$الف) \binom{5}{0} + \binom{9}{1} \rightarrow \binom{m}{n} = \binom{m}{m-n} \Rightarrow \binom{5}{0} = \binom{5}{5} \rightarrow \binom{5}{0} + \binom{9}{1} = \frac{5 \times 4}{1!} + \frac{9 \times 1}{1!} = 20 + 9 = 29$$

$$ب) \binom{9}{3} - \binom{1}{1} = \frac{9 \times 8 \times 7}{3!} - \frac{1}{1!} = 84 - 1 = 83$$

3

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