

نام: A

اسم پدری: اسماعیلی مرز : (روز دهم بهار)

$$f(n) = \frac{1}{2}n^2 + 1 + 2n + 9n^2 + 1 - 8n + m\sqrt{n} + 4n + mn$$

$$= \frac{(10+m)n^2}{2} + (n-8)n + 2 + mn \rightarrow n=8, m=-10$$

$$g(n) = \{(8, -10), (8, \frac{p+1}{-10}), (\frac{p+1}{-9}, -1), (-9, p+k)\}$$

$$\rightarrow p=-11, p+k=-1 \xrightarrow{p=-11} k=10$$

$$m+n+p+k = -10 + 8 + (-11) + 10 = -3$$

$$a) \frac{n-2}{(n^2-8)(n^2+1)} = \frac{n-2}{(n-2)(n+2)(n^2+1)} \geq 0$$

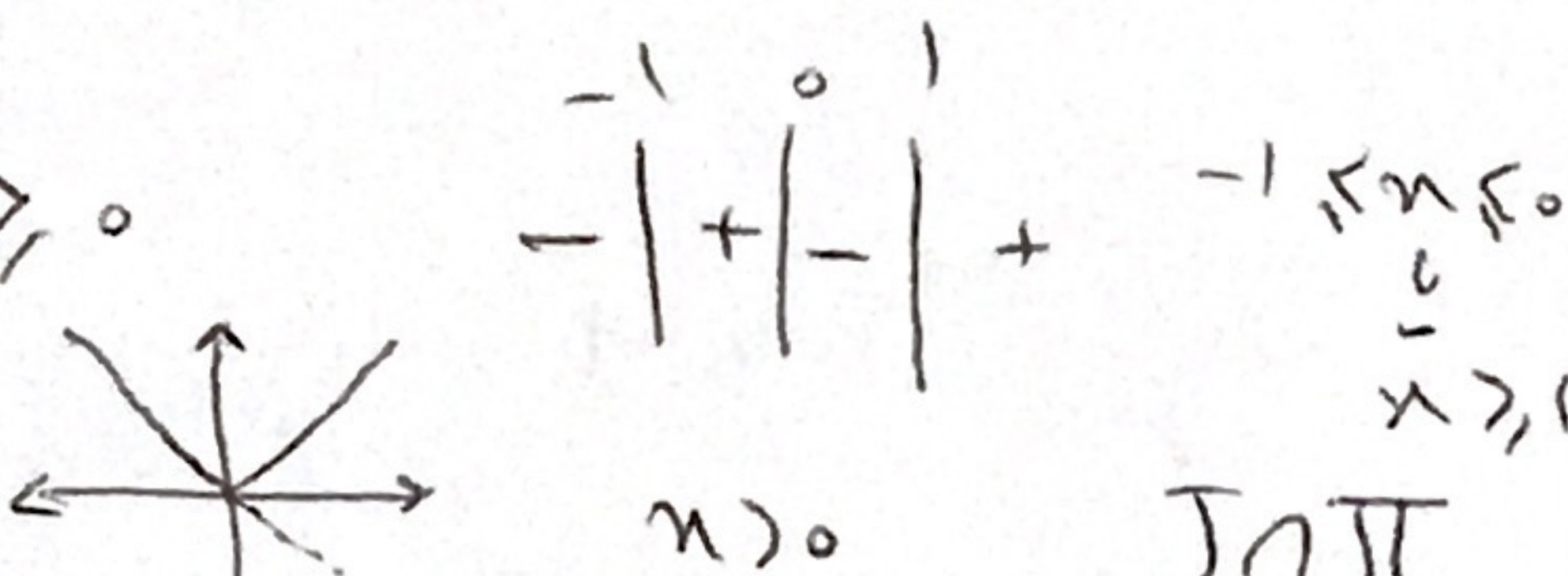
$$\begin{array}{c|cc} n & -2 & 2 \\ \hline p & - & + \end{array}$$

$$D = (-2, +\infty) - \{2\}$$

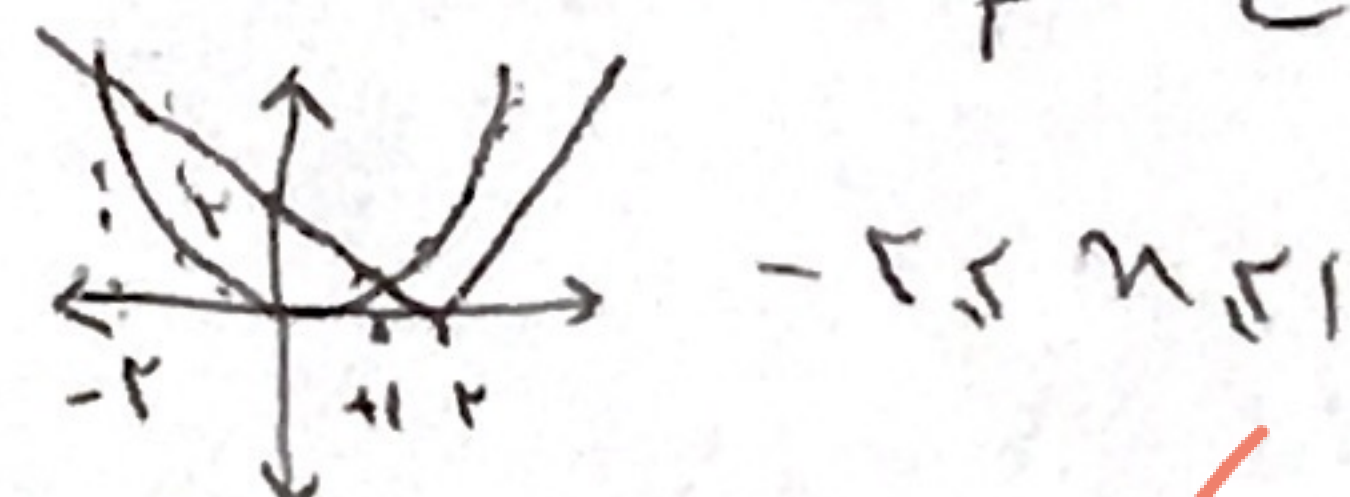
$$b) 8-2[-n] \neq 0 \rightarrow 2 \neq [-n] \rightarrow 2 \leq -n \leq 2 \rightarrow -2 \geq n \geq -2$$

$$D_f = \mathbb{R} - \{(-2, -2)\}$$

$$a) \begin{cases} I) n(n-1)(n+1) \geq 0 \\ II) |n|+n > 0 \end{cases}$$

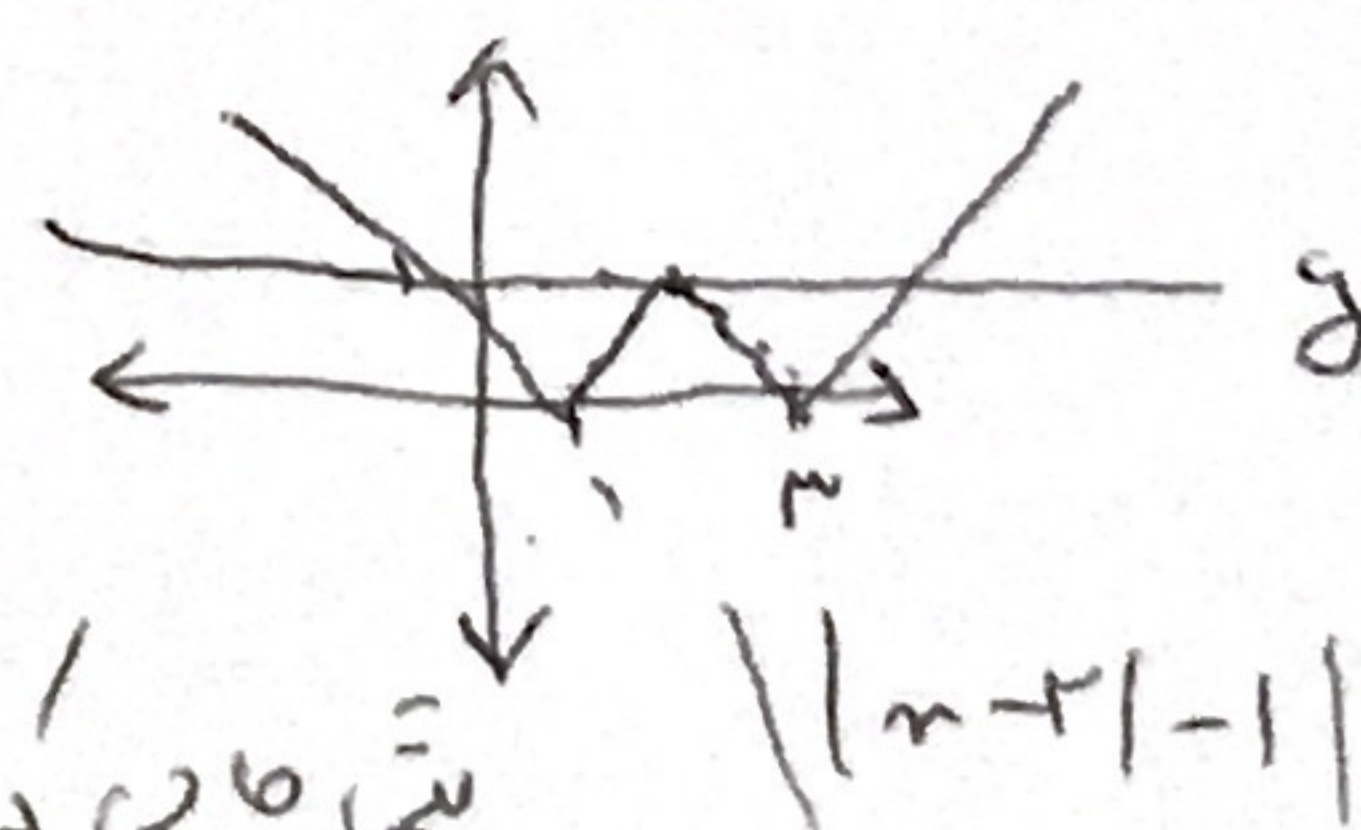
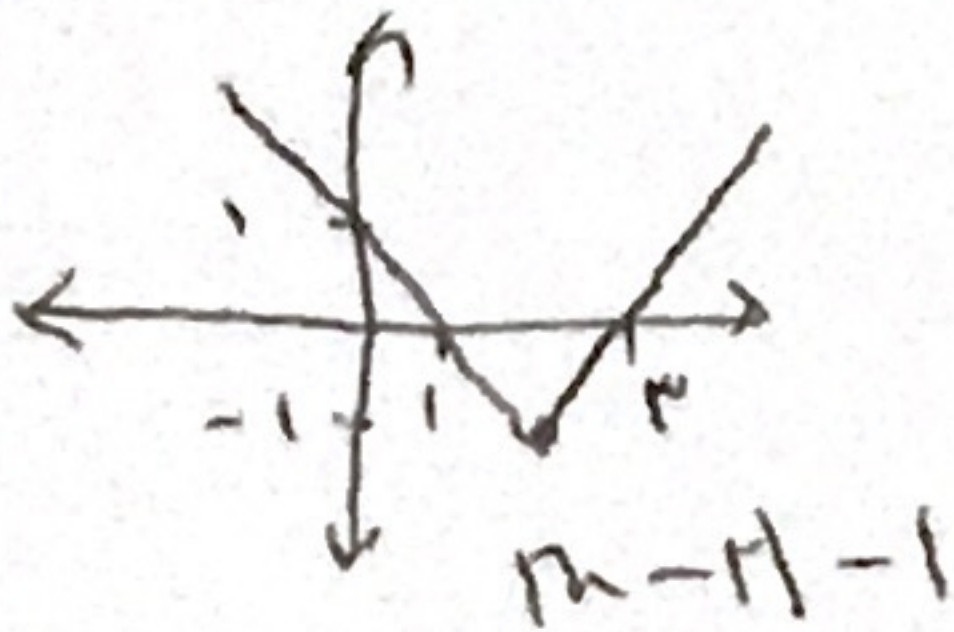
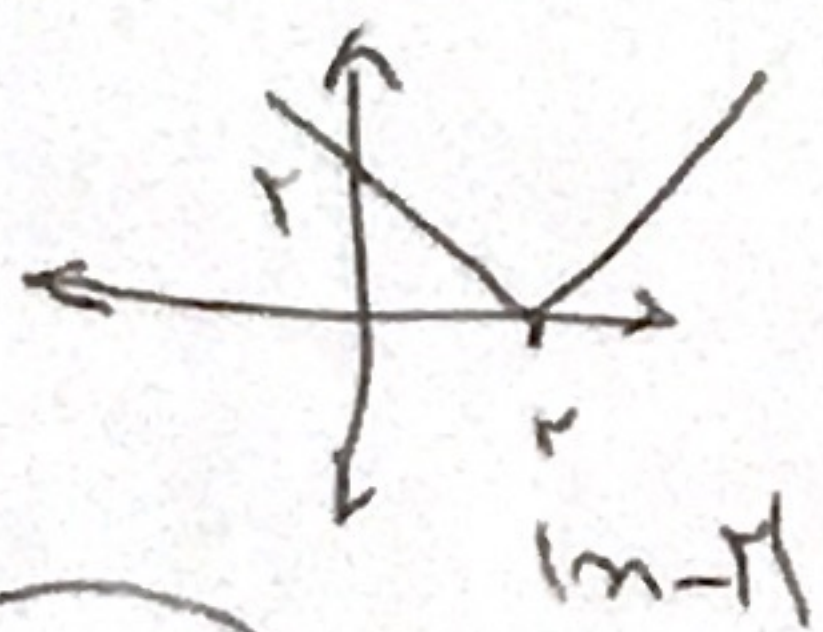


$$b) \begin{cases} I) |n-2|-n^2 \geq 0 \rightarrow |n-2| \geq n^2 \\ II) |n| \neq 1 \rightarrow n \neq 1, -1 \end{cases}$$



$$\rightarrow D_f = [-2, 1) - \{-1\}$$

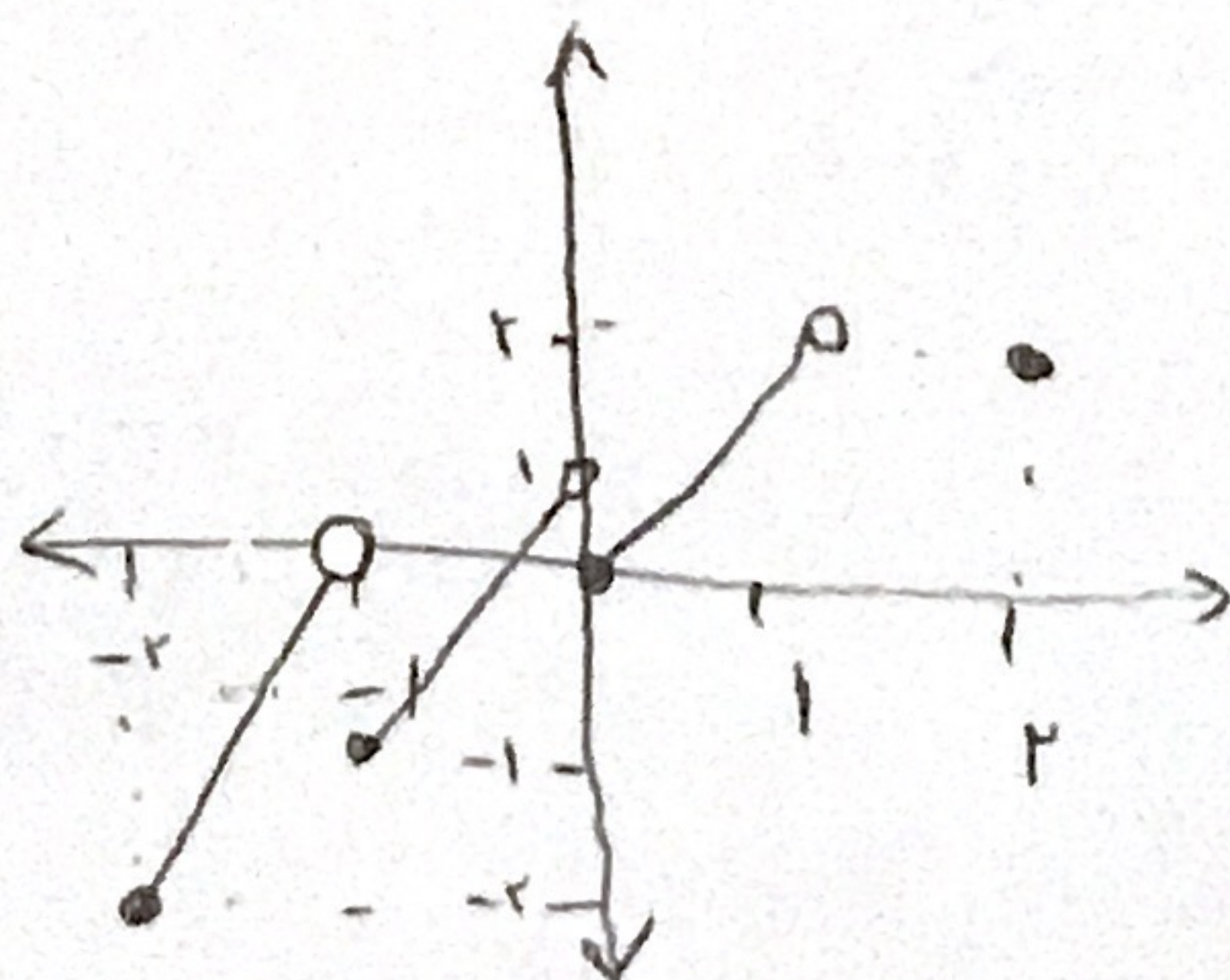
$$||n-2|-1| \neq k$$



$$\rightarrow k=1$$

شماره های 1 و 2 هر دو دارند

$$g = \begin{cases} 2n+2 & -2 \leq n \leq -1 \\ 2n+1 & -1 \leq n \leq 0 \\ 2n & 0 \leq n \leq 1 \\ 2n-1 & 1 \leq n \leq 2 \\ 2n-2 & n=2 \end{cases}$$



$$\frac{(n-1)(n-2)}{n+1} + b$$

$$I: a = -2 \rightarrow b = 1 \rightarrow a+b = -1$$

$$II: a = -1 \rightarrow b = 2 \rightarrow a+b = 1$$

$$a+b = \boxed{-1}$$

$$f(n) = \begin{cases} \frac{a+1/(n+2)/(n-1)}{(n-1)(n+1)} & n \neq \pm 1 \\ \frac{an+2}{n+1} & n = \pm 1 \end{cases}$$

$$\rightarrow C = 2, g(n) = n+2$$

$$\frac{an+2}{n+1} \quad n = \pm 1$$

$$g(1) = 3 = \frac{a+2}{1+1}$$

$$g(-1) = \frac{-a+2}{b-1} = 1$$

$$\rightarrow b = -1, a = 2$$

$$b+c = 2-1 = 1$$

$$b+c = 2, 1, 0$$

فرض کنیم f و g متساوی‌ارزش هستند پس اشتراک دارند پس $f(n) = g(n)$ برای $n \in \mathbb{Z}$

$$f: n \geq 1$$

$$f(n) = \frac{a+1/(n+2)/(n-1)}{(n-1)(n+1)}$$

$$\rightarrow a = \frac{2}{n}$$

$$g: n \geq 1, b = 2 \rightarrow b = 2$$

$$(f-g)(n) = \frac{2}{n} - \frac{2}{n} = 0$$

$$+ (2k-2) - (\sqrt{2-2n} + 2k)$$

$$\xrightarrow{n=1} 2k-2-2k = -2$$

$$\rightarrow k = -1$$

$$2n - \frac{b}{2} - k = 2 - 2 + 1 = 1$$

$$D_f: n \leq m$$

$$D_g: n \geq -1$$

$$D_{f \cap g} = [-1, \infty)$$

$$\rightarrow m \geq \sqrt{2}$$

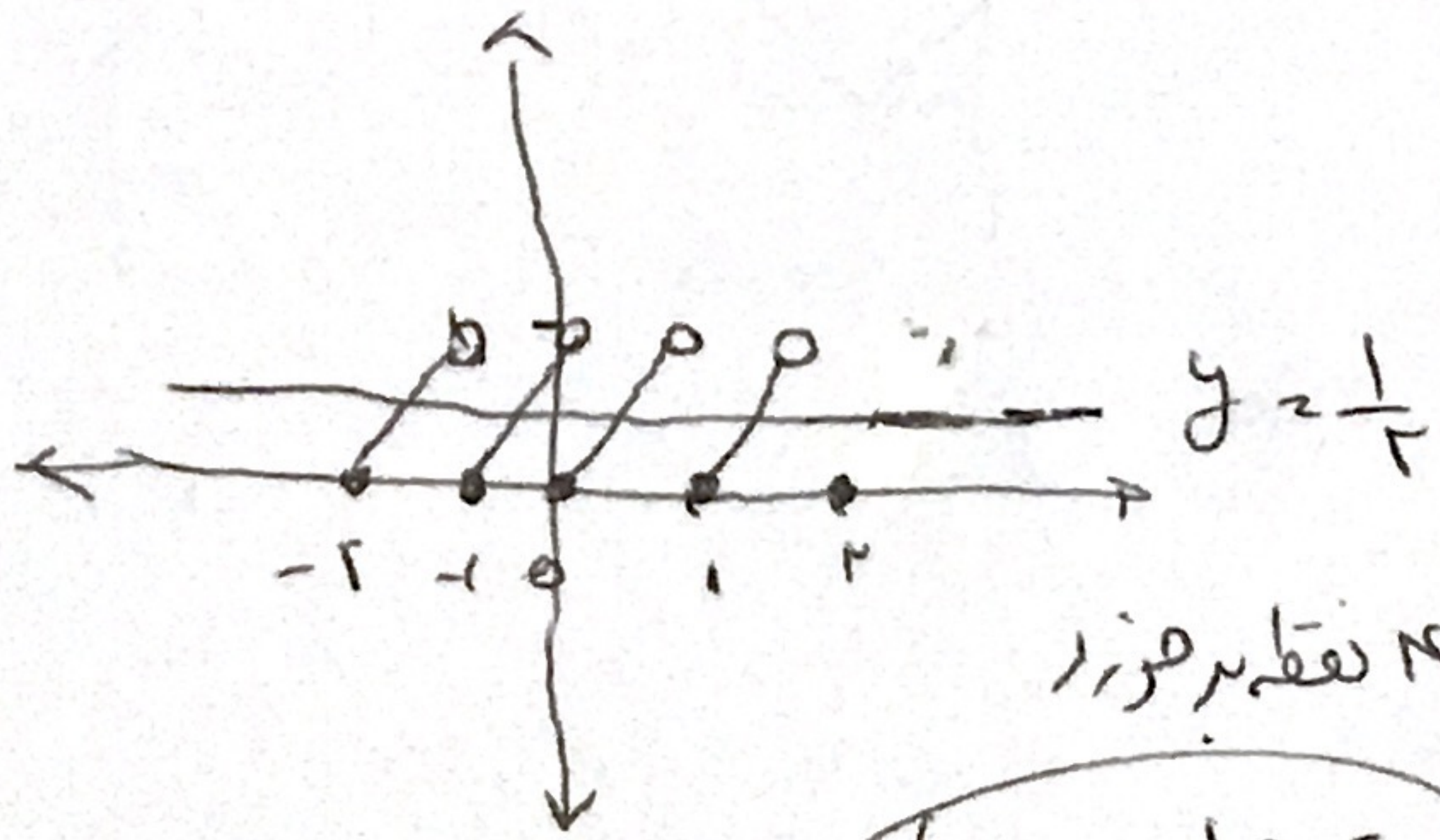
$$\sqrt{2} = f(m) - g(m)$$

$$\rightarrow \sqrt{2} = \sqrt{2} + n$$

$$\rightarrow n = \sqrt{2} - 2$$

$$n+m = \sqrt{2} - 2 + \sqrt{2} = 2\sqrt{2} - 2$$

$$\left\{ \begin{array}{l} -2 \leq n < -1 \\ -1 \leq n < 0 \\ 0 \leq n < 1 \\ 1 \leq n < 2 \\ n = 2 \end{array} \right.$$



۴ جواب دارد