

۱۳. بازدم داشته

۲۰. مستوی برداری

الف) $y^2 - x^2 = 2n - 1$ $\begin{cases} y_1^2 + x_1^2 + x_2^2 = 1 \\ y_2^2 + x_2^2 + x_3^2 = 1 \end{cases} \Rightarrow y_1^2 = y_2^2$ $\checkmark$ $\rightarrow n \cos y = y \cos n$ $\checkmark$
 $\checkmark$ $\rightarrow y - \cos y = y \cos \frac{\pi}{2} = \frac{\pi}{2} \cos y$ $\checkmark$
 $\cos y = 1$ $\oplus$ $y = k\pi + \frac{\pi}{2}$ $\checkmark$
 ب) $\frac{n+y}{x} = \sqrt{ny}$ $n, y > 0$ $\checkmark$
 $n+y = 2\sqrt{ny} \Rightarrow n+y = 2\sqrt{ny}$ $\checkmark$
 $(\sqrt{n} - \sqrt{y})^2 = 0 \Rightarrow \sqrt{n} = \sqrt{y} \Rightarrow n = y$ $\checkmark$
 ج) $n(y_1^2 + x_1^2) - y(y_2^2 + x_2^2) = 0$ $\checkmark$
 $(y_1^2 + x_1^2)(n - y) = 0 \Rightarrow n = y$ $\checkmark$

1 (r)

الف) $|y| + x^2 = ky$ $\checkmark$

$y > 0 \rightarrow x^2 = ky$ $\checkmark$
 $y < 0 \rightarrow x^2 = -ky \rightarrow \frac{x^2}{-k} = y \rightarrow X$ $\checkmark$

$-1 [y] + [x] = 1 \rightarrow x = 1$

$[-1] + [x] = 1 \Rightarrow [x] = 1$

$1 \leq y < \infty$ $\checkmark$

2 (r)

2

$L_1 = \begin{cases} x^2 = b & |n-1| \geq r \\ a+x & -\infty \leq n \leq r \end{cases}$

$L_1 = \begin{cases} x^2 = b & n > r \\ a+x & -\infty \leq n \leq r \\ x^2 = b & n < -1 \end{cases} \Rightarrow n = r$

$a+b = ?$

$r(r)^2 - b \geq a + r(r)$

$(r-b) \geq a+r$

$\boxed{r = a+b} \checkmark$

3 (r)

$L_1 = \sqrt{a-bn-x^2}$ $\checkmark$ $P = \frac{c}{a} = \frac{a}{-1} = -a \rightarrow a \times b = -a$
 $b = -1 \checkmark$

$P_L = [b, a] \quad (a \neq 0, b \in \mathbb{Z})$

$a+b = ?$

$S = \frac{-b}{a} = -\frac{(-b)}{-1} = -b \rightarrow a+b = -b$

$a - 1 \geq 1$ $\checkmark$
 $a = 2 \checkmark$

$a+b \geq 2-1 = 1 \checkmark$

4 (r)

۲۱. در این معادله $ax^2 + bx + c = 0$ a, b, c اعداد صحیح و $a \neq 0$ است.

$y = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $\checkmark$ $\rightarrow \sqrt{b^2 - 4ac} \geq 0$ $\checkmark$ $\rightarrow \sqrt{b^2 - 4ac} \geq 0$ $\checkmark$
 $n = r$

$P_y = (-a, r)$

$r(a+c) - r|b| = 0$

$r(b+c) \geq 0 \rightarrow C \geq -b \checkmark \rightarrow b < 0 \checkmark$

$r(a+c) - r|b| = r(b - r|b|) = b \checkmark$

5 (r)

$$y = \sqrt{\frac{r+a}{n+b}} + a$$

$$\frac{r+a}{n+b} + a =$$

$$\frac{r+a+a(n+b)}{n+b}$$

$$\frac{r+a+an+ab}{n+b}$$

$$D_y = (r, +\infty)$$

$$\frac{n(r+a)+r+ab}{n+b} < \frac{r+a+an+ab}{n+b}$$

$r+a > \rightarrow a > -r$ ✓
 $r+b > \rightarrow b > -r$ ✓

(r) 6

b > 0
 if $\frac{r+a}{n+b} > \frac{r+a}{n+b}$
 then $\frac{r+a}{n+b} > \frac{r+a}{n+b}$, & so on

$$a) y = \sqrt{n^2 - 1}$$

$$\rightarrow y = \frac{1}{\sqrt{|n|-1}}$$

$$n^2 - 1 \geq 0 \rightarrow n \geq 1$$

$$\sqrt{|n|-1} > 0 \rightarrow |n|-1 > 0$$

(r) 7

$$\frac{-1}{-1} = 1$$

$$D_y = (-\infty, -1) \cup (1, +\infty)$$

$$D_y = [-1, 0] \cup [1, +\infty)$$

$$a) y = \sqrt{\frac{1}{|n| - [n]}}$$

$$\rightarrow \sqrt{n} + \sqrt{y} = 9$$

$$\sqrt{y} = 9 - \sqrt{n}$$

$$9 - \sqrt{n} \geq 0$$

$$\sqrt{n} \leq 9$$

$$n \leq 81$$

$$D_y = [0, 81]$$

(r) 8

$$n - [n] \neq 0 \Rightarrow n \neq [n]$$

$$D = \mathbb{R} - \mathbb{Z}$$

$$y = \frac{1}{\sqrt{[r_n - \frac{1}{r}] + [r_n + \frac{1}{r}]}}$$

$$[r_n - \frac{1}{r}] + [r_n + \frac{1}{r}] > 0$$

$$[r_n - \frac{1}{r}] + [r_n + \frac{1}{r}] - 2 > -2$$

$$2[r_n - \frac{1}{r}] > -2$$

$$[r_n - \frac{1}{r}] > -1$$

$$r_n - \frac{1}{r} > -1 \rightarrow r_n > \frac{1}{r} - 1 \rightarrow n > \frac{1}{2}$$

$$D_y = [\frac{1}{2}, +\infty)$$

(r) 9

$$y = \sqrt{1 - \ln(r_n - a)}$$

$$\ln(r_n - a) \rightarrow r_n - a > 0 \rightarrow r_n > a$$

$$a > \frac{a}{r}$$

(r) 10

$$D_y = (b, c]$$

$$1 - \ln(r_n - a) > 0 \Rightarrow \ln(r_n - a) < 1$$

$$r_n - a \leq 1 \rightarrow r_n \leq 1 + a \rightarrow a \leq \frac{1+a}{r}$$

$$c - b = ?$$

$$c - b = \frac{1+a}{r} - \frac{a}{r} = \frac{1}{r}$$