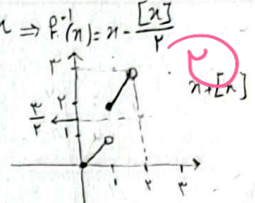
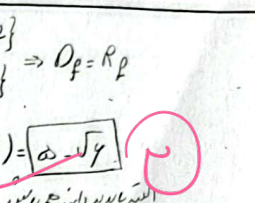
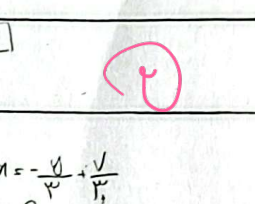
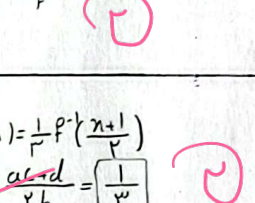
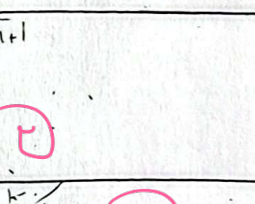
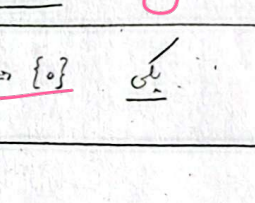
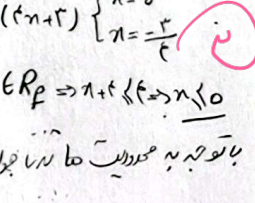
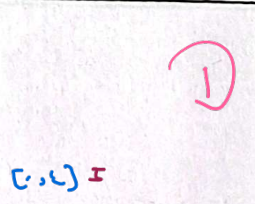
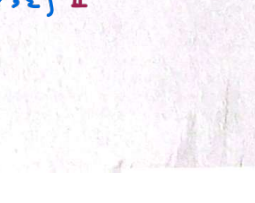


|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ۱  | $f(n) = n + [n] \Rightarrow [n] = [n + [n]] = 2[n] \Rightarrow [n] = \frac{[n]}{2}$<br>$\Rightarrow [n] = 0 \Rightarrow n = 0$<br>$f^{-1}(n) = f(n) \Rightarrow n + [n] = n + \frac{[n]}{2} \Rightarrow \frac{[n]}{2} = 0 \Rightarrow [n] = 0 \Rightarrow n = 0$<br>$f \circ f^{-1}(n) = n \mid 0 = 0 \Rightarrow f \circ f^{-1}(n) = n \Rightarrow n = 0$<br>                                                                                                                                                                      |
| ۲  | $y = \frac{ax+3}{x+b}$<br>$\begin{cases} \text{میانگین} = \frac{a}{b} = y \\ \text{میانگین} = -\frac{b}{a} = x \end{cases} \Rightarrow (-\frac{b}{a}, \frac{a}{b})$<br>$f^{-1}(n) = \frac{-bn+3}{n-a}$<br>$f^{-1}(n) = f(n) \Rightarrow \frac{-bn+3}{n-a} = \frac{an+3}{n+b} \Rightarrow an+3 = -bn+3 \Rightarrow a = -b$<br>$D_f = \mathbb{R} - \{-\frac{3}{a}\}$<br>$R_f = \mathbb{R} - \{\frac{a}{b}\} \Rightarrow D_f = R_f$<br>$f \circ f^{-1}(n) = n \Rightarrow f \circ f^{-1}(n) = n \Rightarrow f \circ f^{-1}(n) = n$<br> |
| ۳  | $f(n) = \frac{mn+3}{n+m+3} = n \Rightarrow mn+3 = n^2+m+3 \Rightarrow n^2-mn+n-3=0$<br>$S = -3, P = -3 \Rightarrow \frac{1}{a} + \frac{1}{b} = \frac{3}{-3} = -1$<br>                                                                                                                                                                                                                                                                                                                                                               |
| ۴  | $f(n) = \sqrt{(n+5)^2} - \sqrt{(n-2)^2} =  n+5  -  n-2 $<br>$\Rightarrow f^{-1}(n) = -\frac{1}{2}n + \frac{7}{2}$<br>                                                                                                                                                                                                                                                                                                                                                                                                              |
| ۵  | $g(n) = 2f(n) - 1 \Rightarrow g(n) = 2 \Rightarrow g^{-1}(2) = n$<br>$2f(n) - 1 = 2 \Rightarrow f(n) = \frac{3}{2} \Rightarrow f^{-1}(\frac{3}{2}) = n$<br>$f^{-1}(\frac{3}{2}) = n \Rightarrow \frac{1}{3}f^{-1}(\frac{3}{2}) = \frac{1}{3}n$<br>$a = \frac{1}{3}, b = 1, c = 2, d = 0 \Rightarrow \frac{a+d}{2b} = \frac{1}{3}$<br>                                                                                                                                                                                             |
| ۶  | $f(n) = n + 2\sqrt{n} = (\sqrt{n}+1)^2 - 1$<br>$\Rightarrow \sqrt{n} = \sqrt{y+1} - 1 \Rightarrow n = (\sqrt{y+1} - 1)^2$<br>$f^{-1}(n) = (\sqrt{n+1} - 1)^2$<br>                                                                                                                                                                                                                                                                                                                                                                 |
| ۷  | $y = n - 1 + 2^n$<br>$f(n) = f^{-1}(n) \Rightarrow n - 1 + 2^n = n \Rightarrow 2^n = 1 \Rightarrow n = 0$<br>                                                                                                                                                                                                                                                                                                                                                                                                                     |
| ۸  | $y = \sqrt{f^{-1}(n)} - n \Rightarrow f^{-1}(n) = (n+y)^2$<br>$f(n) = n^2 + 2ny + y^2$<br>$f^{-1}(n) = n^2 + 2ny + y^2 \Rightarrow f^{-1}(n) = n^2 + 2ny + y^2$<br>                                                                                                                                                                                                                                                                                                                                                               |
| ۹  | $f(x) = x - 2 \Rightarrow f^{-1}(x) = x + 2$<br>$f^{-1}(x+4) = g(x) \Rightarrow f^{-1}(x+4) = x+2$<br>$x+4 = x+2 \Rightarrow 4 = 2$<br>$f(n) = -n + \sqrt{n+4} = -(\sqrt{n+4} - \frac{1}{2})^2 + \frac{17}{4}$<br>$D_f = [-2, +\infty) \Rightarrow R_f = (-\infty, 4] \Rightarrow n+4 \in D_f \Rightarrow n+4 \in R_f \Rightarrow n+4 \leq 4 \Rightarrow n \leq 0$<br>                                                                                                                                                            |
| ۱۰ | $\sqrt{n} + \sqrt{y} = 2 \Rightarrow \sqrt{y} = 2 - \sqrt{n} \Rightarrow y = (2 - \sqrt{n})^2 = f(n)$<br>$f^{-1}(n) = (2 - \sqrt{n})^2$<br>$f \circ f^{-1}(n) = n$<br>$D_f = [0, +\infty) = D_{f^{-1}}$<br>                                                                                                                                                                                                                                                                                                                       |