

نام و نام خانوادگی سبب اینجایی پاسخنامه تشریحی تکلیف شماره ۱۱ کلاس A	
الف) $y = n + [n] \xrightarrow{\text{ارزش یابی}} [y] = 2[n] \rightarrow [n] = \frac{[y]}{2}$ طبق $y = n + \frac{[y]}{2} \xrightarrow{\text{ارزش یابی}} n = y + \frac{[n]}{2} \rightarrow y = n - \frac{[n]}{2} \rightarrow f^{-1}(n) = n - \frac{[n]}{2}$ $n - \frac{[n]}{2} = n + [n] \rightarrow \frac{[n]}{2} = -[n] \rightarrow 0 = 3[n] \rightarrow 0 = [n] \rightarrow 0 \leq n < 1 \rightarrow$ درستش فقط ✓ $f \circ f^{-1}(n) = 2n - \frac{n}{2} = \frac{4n - n}{2} = \frac{3n}{2}$ $f \circ f^{-1}(n) = n$ $n - \frac{[n]}{2} + [n - \frac{[n]}{2}] = 2n - \frac{n}{2} \rightarrow 2n - \frac{n}{2} = n \rightarrow n = \frac{n}{2} \rightarrow n = 0$ غلط	۱ ✓ $n \in D_{f^{-1}} \rightarrow y = n$ $n \in R_f \rightarrow y = n+1$
$y = \frac{an+b}{cn+d} \xrightarrow{\text{ضرب}} \frac{an+b}{cn+d} = y \rightarrow an+b = y(cn+d) \rightarrow an+b = ycn+yd \rightarrow an-ycn = yd-b \rightarrow n(a-yc) = yd-b \rightarrow n = \frac{yd-b}{a-yc}$ $\rightarrow f \circ f^{-1}(n) = f \circ f^{-1}(n) = n \rightarrow f \circ f^{-1}(a-\sqrt{4}) = a-\sqrt{4}$ درست!	۲ ✓ $f(n) = f^{-1}(n)$
$f^{-1}(n) = \frac{-(m+3)n+3}{n-m} = \frac{mn+3}{m+(m+3)} \rightarrow (-m+3)n^2+3n-(m+3)^2n+3(m+3)$ $\rightarrow mn^2+3n-m^2n-3m = -mn^2-3n^2+3n-m^2n-4mn-9n+3m+9$ $\rightarrow mn^2+3n-9n^2-3m \rightarrow -3mn^2-3n^2-9n-4mn+3m+9+3m$ $\rightarrow -(3m+3)n^2-(9+4m)n+4m+9 \rightarrow \frac{1}{a} + \frac{1}{b} = \frac{5}{7} \rightarrow \frac{9+4m}{-3m+9} = 1$ ✓	۳ ✓ $\frac{9+4m}{-3m+9} = 1$
$f(n) = \sqrt{(n+a)^2} - \sqrt{(2n-r)^2} = 2n+a - 2n-r \rightarrow n \geq \frac{r}{2} \rightarrow -2n \leq -\frac{r}{2} \rightarrow -2n+V \leq \frac{r}{2}$ $y = -2n+V \rightarrow V-y = 2n \rightarrow n = \frac{V-y}{2} \rightarrow y = \frac{V-n}{2}$ $\rightarrow f^{-1}(n) = \frac{V-n}{2} \quad n \leq \frac{r}{2}$ $D_f = R_{f^{-1}} / R_f = D_{f^{-1}} \rightarrow (-\infty, \frac{r}{2}]$ ✓	۴ ✓ $n \leq \frac{r}{2} \rightarrow 2n+V \leq \frac{r}{2}$
$g(n) = K \rightarrow 2f(2n)-1 = K \rightarrow K = 2f^{-1}(\frac{K+1}{2}) = 2n \rightarrow n = \frac{f^{-1}(\frac{K+1}{2})}{2}$ $g^{-1}(n) = \frac{1}{2} f^{-1}(\frac{n+1}{2})$ $\rightarrow a = \frac{1}{2}$ ✓ $\rightarrow b = 1$ ✓ $\rightarrow c = 2$ ✓ $\rightarrow d = 0$ ✓ $\frac{ac+d}{2b} = \frac{\frac{1}{2} \times 1 + 0}{2 \times 1} = \frac{1}{4}$ ✓	۵ ✓ $\frac{1}{4}$

$f(n) = n + 2\sqrt{n} \rightarrow R_f = [0, +\infty)$ $\rightarrow y = (n + 2\sqrt{n} + 1) - 1 \rightarrow y + 1 = (\sqrt{n} + 1)^2 \rightarrow \sqrt{y+1} - 1 = \sqrt{n}$ $y + 1 + 1 - 2\sqrt{y+1} = n \rightarrow f^{-1}(n) = y = n + 2 - 2\sqrt{n+1} \quad (D_f = R_{f^{-1}} = [1, +\infty))$ $\rightarrow f^{-1}(n) = n - 2\sqrt{n+1} + 2, \quad n \in [0, +\infty)$	۶ ۲
$y = n - 1 + 2^n$ از این به بعد تابع را بررسی می‌کنیم $n = y - 1 + 2^n$ $1 = 2^n \xrightarrow[n=0]{y=0} (0, 0) \rightarrow \text{بررسی می‌کنیم}$	۷ ۲
$f(n) = n^2 + \varepsilon n$ از این به بعد تابع را بررسی می‌کنیم $y = \sqrt{f^{-1}(n) - n} \rightarrow f^{-1}(n) \geq n \rightarrow n \geq f(n)$ $\rightarrow n \geq n^2 + \varepsilon n \rightarrow n^2 + \varepsilon n \leq 0$ $n(n + \varepsilon) \leq 0 \rightarrow n \leq 0$	۸ ۲
$n = -y + \sqrt{y + \varepsilon} \rightarrow n + y = \sqrt{y + \varepsilon} \rightarrow (n + y)^2 = y + \varepsilon \rightarrow n^2 + 2ny + y^2 - y - \varepsilon = 0$ $\rightarrow y^2 + (2n - 1)y + (n^2 - \varepsilon) = 0 \rightarrow y = \frac{-b \pm \sqrt{\Delta}}{2a} \rightarrow \frac{-(2n - 1) \pm \sqrt{(2n - 1)^2 - 4(n^2 - \varepsilon)}}{2}$ $\rightarrow \varepsilon n^2 - \varepsilon n + 1 - \varepsilon n^2 + 14 = 14 - \varepsilon n$ $y = \frac{-2n + 1 \pm \sqrt{14 - \varepsilon n}}{2}$ $y = \frac{-2(n + \varepsilon) + 1 + \sqrt{14 - \varepsilon(n + \varepsilon)}}{2} \rightarrow \frac{-2n - \varepsilon + 1 + \sqrt{14 - \varepsilon n - \varepsilon^2}}{2}$	۹ ۲
$\sqrt{n} + \sqrt{y} = 2 \rightarrow \sqrt{y} + \sqrt{n} = 2 \rightarrow f(n) = f^{-1}(n)$ $f \circ f(n) = f \circ f^{-1}(n) \rightarrow n$ $D_{f^{-1}} = R_f = [0, \varepsilon]$ $D_f = [0, \varepsilon]$	۱۰ ۲