

۲۰ نیم نوبت

① $Df(n) = [-4 \ 2] \quad Pf(3n-2)$

$$-4 \leq 3n-2 \leq 2 \rightarrow -2 \leq 3n \leq 4 \rightarrow \boxed{-\frac{2}{3} \leq n \leq \frac{4}{3}}$$

۲) $Df(3n-2) = [-4 \ -2] \quad Df(n)?$

$$-4 \leq x \leq -2 \rightarrow -12 \leq 3n \leq -6 \rightarrow \boxed{-14 \leq 3n-2 \leq -8}$$

$$Df(n) = [-14 \ -8]$$

③ $f(n) = n + \sqrt{n-2} \rightarrow g = (x-2) + \sqrt{(n-2)-2}$

* تابع صعودی است پس داریم بیشترین مقدار را با جایگزینی $n=8$ می‌گیریم.

$$f(n) = n-2 + \sqrt{n-2} \xrightarrow{f(n)=n} x = n-2 + \sqrt{n-2}$$

$$\rightarrow n=8 \rightarrow \boxed{y=8}$$

④ $g(n) = 2f(3n+1) \rightarrow Rf = [0 \ 2]$

$$0 \leq x \leq 2 \rightarrow 0 \leq 3n+1 \leq 12 \rightarrow 1 \leq 3n+1 \leq 13 \rightarrow Pf = [1 \ 13]$$

$$S = \frac{(13-1) \times 2}{2} = 12$$

⑤ $\frac{x'-a}{p} = 2 \rightarrow x' = t+a$

$$y' = a + 2(-2) \rightarrow y' = a-4$$

$$(a-4) = 2(t+a) - 1 \rightarrow a-4 = 2t+2a-1 \rightarrow \boxed{a=-4}$$

Subject: ()

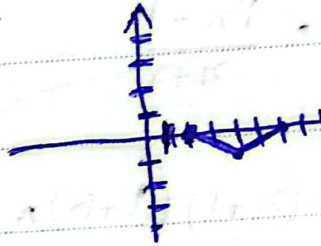
② $h(x) = -f(x-r)$

$0 \leq x \leq r \rightarrow -r \leq x-r \leq 0 \xrightarrow{f(x-r)} -r \leq (r-x) \leq r$

$\rightarrow -r \leq -x \leq -r \rightarrow \boxed{r \geq x \geq r}$ ✓

$\max_{x \in [0, r]} -f(x-r) = r \rightarrow f(x-r) = -r \xrightarrow{\min} f(x) = -r$

$\min_{x \in [0, r]} f(x) = -r$ ✓



③ $y = \sqrt{-(x+r)f(r-x)}$

	$-r$	$x=0$	$x=r$	$x=r$
$f(r-x)$	$-r$	0	$+$	0
$-(x+r)$	$+$	0	$-$	$-$
y	$-$	0	$+$	0

$\rightarrow D_y = [-r \ 0] \cup [1 \ r]$ ✓

④ $f(x) = |rx - r| + 1 \rightarrow f(x) = |r(x+k) - r| + 1$

$\rightarrow f(x) = |r(x+k) - r| - r$

$|rx + rk - r| - r = 0$

$f(x) = |rx - r| + 1 \xrightarrow{x=0} \boxed{y = r}$

$\xrightarrow{x=0, y=r} |rk - r| - r = r \rightarrow |rk - r| = r \rightarrow rk = 2r \quad k = 2$

$\rightarrow rk = -r \quad k = -1$

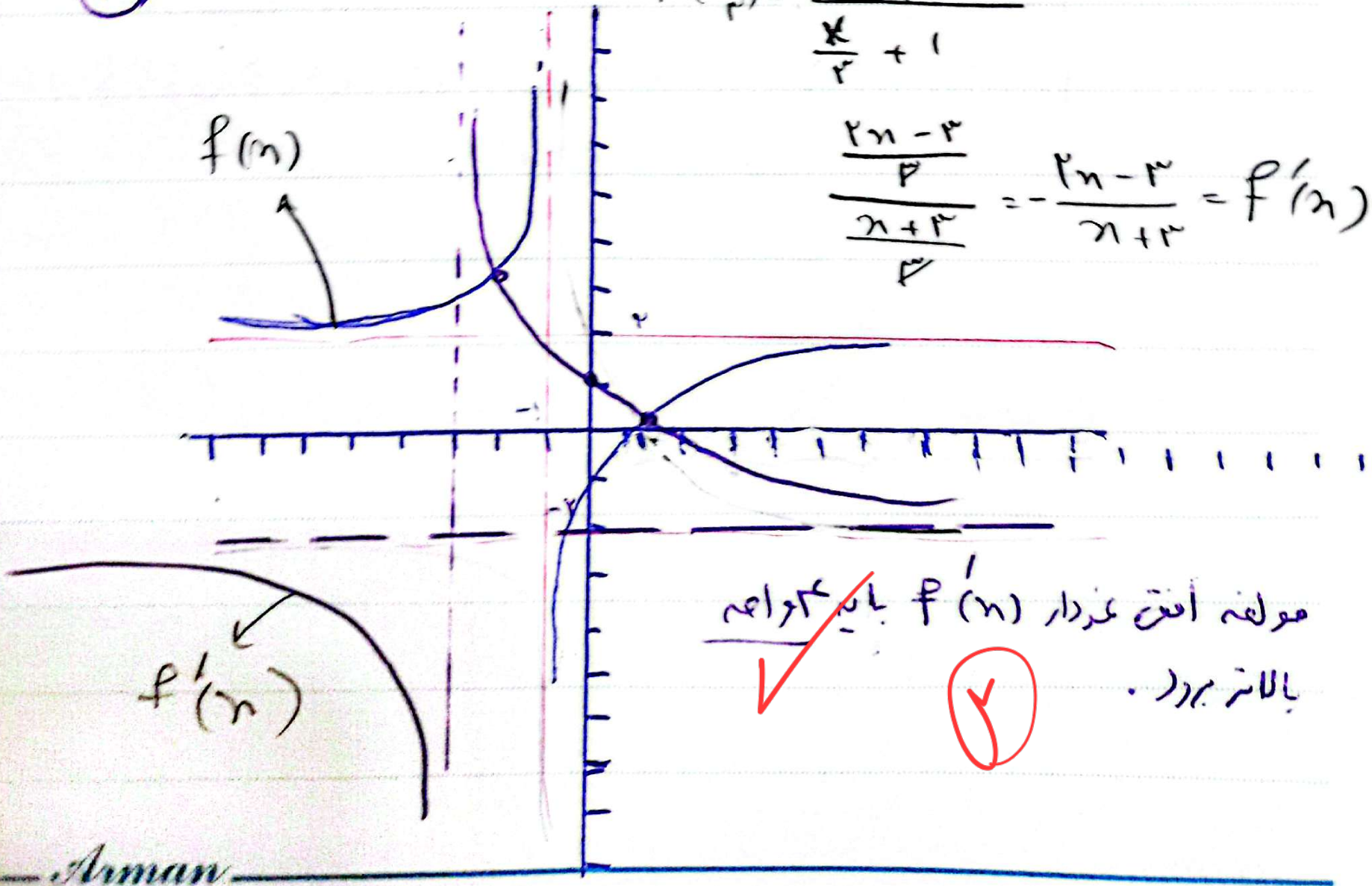
$\rightarrow k > 0 \rightarrow k = 2$ ✓

— Arman —

①

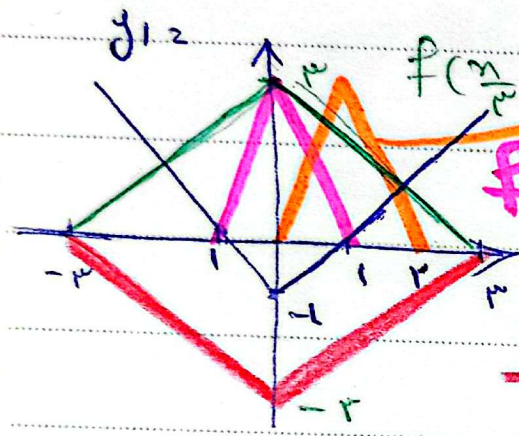
$$f\left(\frac{x}{r}\right) = \frac{\ln\left(\frac{x}{r}\right) - 1}{\frac{x}{r} + 1}$$

$$\frac{\frac{rx - r}{r}}{\frac{x + r}{r}} = -\frac{rx - r}{x + r} = f'(x)$$



مولفه افق عدد $f'(x)$ با $f(x)$ مواضع
بالا تر برد. ✓

②



$$f\left(\frac{n}{r}\right) \rightarrow f(n-1) = \cancel{f(n)} - \cancel{f(n)}$$

$$y = rn \quad 0 \leq n \leq 1$$

$$y = -rn + r \quad 1 \leq n < 2$$

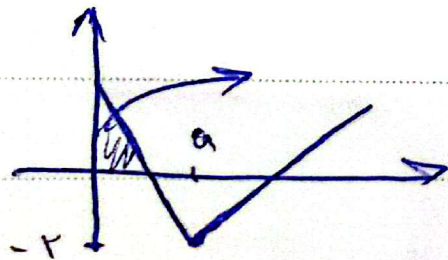
$$rn = r \quad n = \frac{r}{r}$$

$$-rn + r = r \quad n = \frac{r}{r}$$

$$\text{area} = \frac{r}{2} \times 1 \times \frac{1}{r} = \frac{1}{2}$$



$$f(n) = |n - a| - r$$



$$\frac{(a-r)^r}{r} + \frac{r \times r}{r} = \frac{9}{r}$$

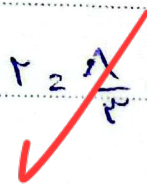
$$\frac{(a-r)^r}{r} = \frac{1}{r}$$

$$a = r \quad \text{or} \quad a = -1$$



$$f(n) = |n - r| - r$$

$$f\left(\frac{1}{r}\right) = \left|\frac{1}{r} - r\right| - r = \left|-\frac{r}{r}\right| - r = \frac{1}{r} - r = \frac{1-r^2}{r}$$



Arman