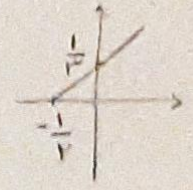


آرنامی کیا - تکلیف ۱۰:

۱۸، ۵

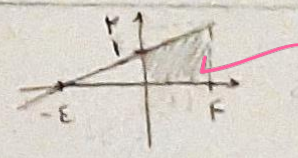
۱. $2u + 2y - 1 \Rightarrow \frac{2u+1}{3} = y \Rightarrow f'(u) = \frac{2u+1}{3}$



S. $\frac{1}{3} = \frac{1}{2} \cdot \frac{1}{12}$ (۲)

۲. $\frac{-b}{2a} = \frac{-(2)}{2(1)} = 1$ $\Rightarrow y = u^2 - 2u + 3 \Rightarrow y = (u-1)^2 + 2$
 Minimum point $\Rightarrow y = 2$
 $y - 2 = (u-1)^2 \Rightarrow \sqrt{y-2} + 1 = u$
 $u \geq 2 \Rightarrow y \geq 4$

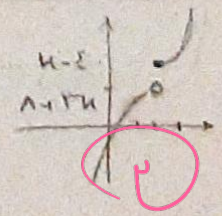
۳. $\frac{2u - \sqrt{14 - 4u^2 - 14u}}{(2u-4)^2} = 2u - 12u - 41 \Rightarrow u \geq 2: F$
 $u < 2: F u - 4$
 The function has a minimum at $u = 2$



در $(-\infty, 2]$ وارون پذیر است
 $\frac{(1+2) \times 4}{2} = 6$ (۲)

۴. $\frac{u_1}{\sqrt{u_1^2 - 5}} = \frac{u_2}{\sqrt{u_2^2 - 5}} \Rightarrow \frac{2u_1}{u_1^2 - 5} = \frac{2u_2}{u_2^2 - 5} \Rightarrow u_1^2 u_2^2 - 5u_1^2 = u_1^2 u_2^2 - 5u_2^2 \Rightarrow u_1^2 = u_2^2 \Rightarrow u_1 = \pm u_2$
 The function is symmetric about the y-axis.
 $y = \frac{u}{\sqrt{u^2 - 5}} \Rightarrow y^2 = \frac{u^2}{u^2 - 5} \Rightarrow y^2(u^2 - 5) = u^2 \Rightarrow u^2(y^2 - 1) = 5y^2 \Rightarrow u^2 = \frac{5y^2}{y^2 - 1} \Rightarrow u = \pm \sqrt{\frac{5y^2}{y^2 - 1}}$

۵. $u^2 - 4u + 4 = \frac{-b}{2a} = \frac{4}{2} = 2 \Rightarrow u = 2 \Rightarrow y = (2)^2 - 4(2) + 4 = 4 - 8 = -4$
 $-u^2 + 4u + 2u = -4 + 2u \Rightarrow -4 + 6u = 2u \Rightarrow 4u = 4 \Rightarrow u = 1 \Rightarrow y = 1 - 4 + 4 = 1$
 The function has a minimum at $u = 2$ and a maximum at $u = 1$.



یابسی قرار ک-ع

۶. $u > 0 \rightarrow f(u) = fu \Rightarrow u = \frac{y}{f} \checkmark \Rightarrow y = \frac{u}{f}$
 $u < 0 \rightarrow f(u) = fu \Rightarrow u = \frac{y}{f} \checkmark \Rightarrow y = \frac{u}{f}$

نسب u از نسب u کمتر است پس b باید منفی باشد

$$\left. \begin{aligned} \frac{u}{f} + \frac{u}{f} &= \frac{u}{\lambda} \\ \frac{u}{f} - \frac{u}{f} &= \frac{u}{\lambda} \end{aligned} \right\} \begin{aligned} \frac{r}{\lambda} u + \frac{1}{\lambda} |u| \\ \downarrow a \quad \downarrow b \end{aligned}$$

$ab = \frac{u}{4f}$
 $b = \frac{1}{\lambda} \rightarrow ab = -\frac{u}{4f}$
1, 1/4

V. $u = r \rightarrow \frac{r(r) + \varepsilon}{r + m} \rightarrow -1 \Rightarrow 1 = -r, 1 + m \Rightarrow m = -r \Rightarrow \frac{ru + \varepsilon}{u - r}$ (a+d=0) $\Rightarrow f^{-1}(u) = f(u)$ (2)
 $f \circ f^{-1}(u) = u(0) \xrightarrow{I, II} u + \frac{ru + \varepsilon}{u - r} = u \Rightarrow \frac{ru + \varepsilon}{u - r} = 0 \Rightarrow u = -\frac{\varepsilon}{r}$ r

۸. $f(r - ru) = r - g(\frac{u}{r}) \Rightarrow f^{-1}(-r) = r - ru \Rightarrow u = \frac{r - f^{-1}(-r)}{r}$ $r - g(\frac{u}{r}) = -r \Rightarrow g(\frac{u}{r}) = \varepsilon$
 $g^{-1}(\varepsilon) = \frac{u}{r} \Rightarrow u = rg^{-1}(\varepsilon) \Rightarrow rg^{-1}(\varepsilon) = \frac{r - f^{-1}(-r)}{r} \Rightarrow \varepsilon g^{-1}(\varepsilon) + f^{-1}(-r) = r$ r

۹. $u \rightarrow \frac{-(-\omega u - 1r)}{1 + m} = \frac{\omega u + r}{u + 1} \xrightarrow{\text{ضرب در } u+1} \frac{\omega(u+1) + 1r}{(u+1)+1} = \frac{\omega u + r}{u+1} \xrightarrow{\text{ضرب در } u-1} \frac{\omega u + r - r}{u-1} = \frac{\omega u + r - ru + 1r}{u-1}$ 1/8
 $\Rightarrow \frac{ru + r}{u-1} \quad \frac{ru + r}{u-1} + \frac{\omega u - 1r}{1 - \omega} \rightarrow ru - ru + r - ru - \omega u^2 - 1ru - \omega u + 1r \rightarrow \omega u^2 - 1\varepsilon u + r = 0$
 $\omega u^2 - ru + 1r = 0 \Rightarrow u = 1$
 $f^{-1}(u) = \frac{u+r}{u-r} \rightarrow f(u) = f(u) \rightarrow u^2 - ru - r = 0 \rightarrow u = -\frac{r}{2}$

۱۰. $u + \varepsilon[u] \Rightarrow f(u) = u + \varepsilon t \Rightarrow y = u + \varepsilon t \Rightarrow u = y - \varepsilon t \Rightarrow y = u - \varepsilon t \Rightarrow$ 1/20
 $y - y^{-1} = (u + \varepsilon t) - (u - \varepsilon t) = 2\varepsilon t \quad f \circ g(u) = 1\varepsilon = 1[u]$
 $[y] = \omega[u] \rightarrow [u] = \frac{[y]}{\omega} \rightarrow f^{-1}(u) = u - 1[u]$
 $f \circ g = u + \varepsilon[u] = u + 1[u] = ru[u]$