

فاطمة عثمان

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1) $D \text{ gof}(u) = ?$ $f(u) = \sqrt{\log_p(u-1)}$ $g(u) = \sqrt{-u^2 + 5u - 4}$

$D \text{ gof}(u) = \{ \alpha \mid \alpha \in D_f, f(\alpha) \in D_g \}$

$\rightarrow f(u) = \sqrt{\log_p(u-1)} \Rightarrow$ I) $u-1 > 0 \rightarrow u > 1$ II) $\log_p(u-1) \geq 0 \rightarrow u-1 \geq 1$
 $\rightarrow u \geq 2$

$\rightarrow g(u) = \sqrt{-u^2 + 5u - 4} \rightarrow -u^2 + 5u - 4 \geq 0$

$u^2 - 5u + 4 \leq 0 \rightarrow (u-2)(u-4) \leq 0 \rightarrow$ قبل $u=2$ ممنوع

$\rightarrow \sqrt{\log_p(u-1)} = 2 \rightarrow \log_p(u-1) = 4 \rightarrow u-1 \leq 16 \rightarrow$ 2 ≤ u ≤ 17

\rightarrow $D \text{ gof} = \{17\}$

2) $f(u) = 2u - 1$ $g(u) = u^2 - 3u + 1$ $\log(u) = \text{gof}(u) = \alpha^2 + \beta^2 + \dots = ?$

$\log(u) = 2(u^2 - 3u + 1) - 1 = 2u^2 - 6u + 2 - 1 = 2u^2 - 6u + 1$

$\text{gof}(u) = (2u-1)^2 - 3(2u-1) + 1 = 4u^2 - 4u + 1 - 6u + 3 + 1 = 4u^2 - 10u + 5$

$\rightarrow 4u^2 - 10u + 5 = 4u^2 - 10u + 5 \rightarrow 4u^2 - 10u + 5 = 0 \rightarrow u > 0 \rightarrow$ 2 < u < 5

$\alpha \neq \beta^2 = ? \rightarrow (\alpha + \beta)^2 - 2\alpha\beta = \left(\frac{10}{4}\right)^2 - 2 \times \frac{5}{4} = 100 - 25 =$ 75

3) $\text{gof}(u) = d \cdot u^2 + 11$ $f(u) = 2u - 1$ $g(u-v) = ?$

$2u-1 \rightarrow u = \frac{t}{2} \rightarrow d \left(\frac{t}{2}\right)^2 + 11 = \frac{dt^2}{4} + 11 = \frac{d}{4} t^2 + 11 \rightarrow g(u) = \frac{d}{4} u^2 + 11$

$g(u-v) = \frac{d}{4} \times (u-v)^2 + 11 = \frac{d}{4} \times (u^2 - 2uv + v^2) + 11 \Rightarrow$

$g(u+v) = \frac{d}{4} u^2 - \frac{d}{2} uv + \frac{d}{4} v^2 + 11 \xrightarrow{u=0} \text{moment} \rightarrow m = -\frac{b}{2a} = -\frac{\frac{d}{2} v}{\frac{d}{4}} = -\frac{2v}{1} = -2v$

$= v \rightarrow \frac{d \cdot 0}{4} + \frac{d \cdot v^2}{4} - \frac{d \cdot 0}{2} = \frac{d \cdot v^2}{4} =$ 11

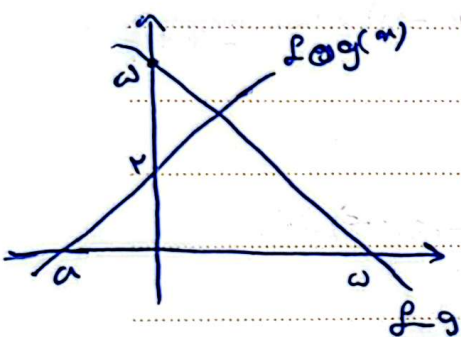
۱) $f(x) = x^p - 1$ $g(x) = x^p - 1$ $\rightarrow g \circ f(x) = ?$

$x^p - 1 = x^p - 1 \rightarrow x^p = x^p - 1 + 1 \rightarrow x = x^{\frac{p}{p}} - 1 + 1$

$\rightarrow g(x) = (x-1)^p \rightarrow g \circ f(x) = (x^p - 1 - 1)^p = (x^p - 2)^p$

$g \circ f(x) = 9x^p - 10x + 10$

۲) $g \circ f, f \circ g \rightarrow f(x) = x^2 - 1 \rightarrow a = ?$



$f(x) = x^2 - 1$ $g(x) = x^2 + 1$

$f \circ g = -x + 1$
 $g \circ f = x^2 - 1$ $\rightarrow g(x) = x^2 - 1$

$g \circ f(x) = x^2(x^2 - 1) + 1 = x^4 - x^2 + 1$

$9a + 1 = 0 \rightarrow 9a = -1 \rightarrow a = -\frac{1}{9} \in \mathbb{R}$

۳) $f(x) = 9^x$ $g(x) = \log_9 x \rightarrow g \circ f(x) = ?$

$g \circ f = 9^{\log_9 x} = x$ $g \circ f(x) = \log_9 9^x = x$

$x^p \geq x^q \rightarrow x^p - x^q \geq 0 \rightarrow x(x^{p-q} - 1) \geq 0$

$\rightarrow [0, 1] \rightarrow \{0, 1, 2\} \rightarrow [0, 2]$

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v) $f\left(\frac{m^p}{n}\right) = n^p + m - p - \frac{p}{m} + \frac{p}{m^p}$

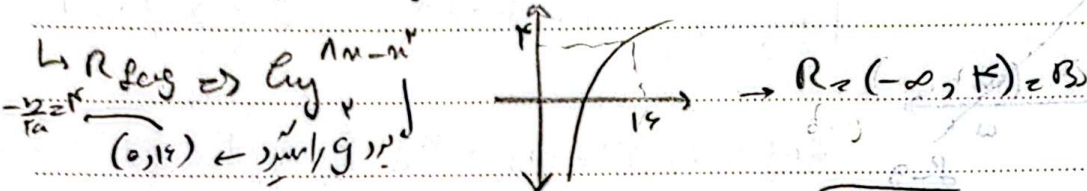
$\rightarrow \frac{m^p}{n} = n - \frac{p}{n} \rightarrow m = \frac{p}{n} = t \rightarrow \frac{m^p}{n} + m - p - \frac{p}{m} + \frac{p}{m^p} = t^p + m - \frac{p}{m} = t^p + t = t$

$\rightarrow = t^p + t \Rightarrow f(m) = m^p + m$

~ 1) $f(m) = \log_p m$, $g(m) = \wedge m - m^p \rightarrow A = D \log \rightarrow A \cap B = ?$
 $B = R \log$

$D \log \Rightarrow \log_p x \Rightarrow x > 0 \rightarrow \wedge m - m^p > 0 \rightarrow m(\wedge - m) > 0 \rightarrow \frac{0}{-p+p} = \wedge$

$\rightarrow (0, \wedge) = D \log = A$



$A \cap B = (0, \frac{p}{m}) \rightarrow A \cap B = \{1, p, p^2\}$ مجموعه

9) $f \circ f(m) = 1 - p f^p(m)$, $g(m) = m - 1$, $h(m) = m^p + pm + 1$

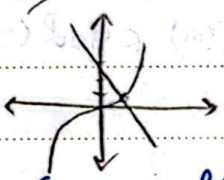
$\rightarrow h(g(m)) = f(m) \rightarrow$ مجموعه = ?

1) $f(f(m)) = 1 - p f^p(m) \rightarrow f(t) = 1 - p t^p \rightarrow f(m) = 1 - p m^p$

$\rightarrow h(g(m)) = (m-1)^p + p(m-1) + 1 = m^p - p m^p + p m - 1 + pm - p + 1$

$h(g(m)) = m^p - p m^p + pm - p + 1 = 1 - p m^p \rightarrow m^p + pm - p = 0$

$m^p = pm - p$
مجموعه \rightarrow مجموعه



1.) $f(m) = m - \frac{p}{m}$, $g \circ f(m) = am^p + pm$, $g(p) = \wedge \rightarrow a = ?$

$m - \frac{p}{m} = p \rightarrow a^p - p = pm \Rightarrow m^p - pm - p = 0 \rightarrow m = 1, p$

$\rightarrow m = -1 \rightarrow g(f(-1)) = -a - p = \wedge \Rightarrow a = -1 - p$
 $m = p \rightarrow g(f(p)) = p^p a + p = \wedge \Rightarrow a = 0$

روز دامپزشکی