نام و نام خانوادگی: امیرحسین خاشعی کلاس: یازدهم پسر B شماره تکلیف: ۲۴

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①

$x=1 \longrightarrow y=x^2 \to 1$

$f(1)=3^{A+B} \to 3^{A+B}=1 \to A+B=0$

$x=2 \longrightarrow y=x^2 \to 4$

$f(2)=3^{2A+B} \longrightarrow 3^{2A+B}=3^2 \to 2A+B=2$

$A=1$, $B=-1$, $f(x)=3^{x-1}$

$f(0)=3^{-1}=\boxed{\frac{1}{3}}$ جواب

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②

$\log_2^{2^x+15} = x+4 \to 2^{x+4} = 2^{2x}+15 \xrightarrow{2^x=t} t^2-8t+15=0 \to (t-3)(t-5)=0$

$t=3 \to 2^x=3$ ← از دوطرف $\log_2$ ← $\log_2^{2^x} = \log_2^3 \to x=\log_2^3$

$t=5 \to 2^x=5$ ← از دوطرف $\log_2$ ← $\log_2^{2^x} = \log_2^5 \to x=\log_2^5$

$\log_2^3 + \log_2^5 = \log_2^{15}$ جواب

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③

$(\log_{21}^3)^2 + \log_{21}^{147} \times \log_{21}^{343} \to (\log_{21}^3)^2 + (\log_{21}^3 + \log_{21}^7) \times (\log_{21}^7 + \log_{21}^{49})$

$\log_{21}^{49} = \log_{21}^{21^2} = 2\log_{21}^{21}$

$\xrightarrow{\log_{21}^7 + \log_{21}^3 = \log_{21}^{21}=1} (\log_{21}^3)^2 + (\log_{21}^3 + 2)(2 - \log_{21}^3) = \boxed{4}$ جواب

$4 - (\log_{21}^3)^2$

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④

$\log(x^2-2x+1) + 2\log(1-x) = 2 \longrightarrow \log((1-x)^2) + 2\log(1-x) - 2 = 0$

$\log(1-x)=t \longrightarrow 2t+2t-2=0 \longrightarrow t=1$

$\log(1-x)=1 \to 1-x=10$

$x=-9$

$\log_3^{(-x)} \to \log_3^9 = \boxed{2}$ جواب

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⑤

$\log_2^{(x+2)} + \log_2^{(2-x)} = 2 \longrightarrow \log_2^{(2-x)(x+2)} = 2$

$\log_2^{(7-2x)} = 2 \to x^2 = 14 \to x = 2^{\frac{3}{2}}$

$\log_{\frac{1}{2}2}^{\frac{1}{2}2^{\frac{3}{2}}} = \log_{2^{-1}}^{2^{\frac{3}{2}}} = \log_2^{\frac{3}{2}}$

$\boxed{3}\log_2^2 = 3$ جواب

④

$x-2=t$

$\log t - \log \frac{1}{t^2} = 2 \rightarrow \log \frac{t}{\frac{1}{t^2}} = 2 \rightarrow \log t^3 = 2 \rightarrow t^3 = 10^2 \Rightarrow t = 10$

$x-2=10 \rightarrow \boxed{x=12}$

جواب ← (4) $\log_{\sqrt{2}} 8 = \log_{2^{\frac{1}{2}}} 2^3 = \frac{1}{\frac{1}{2}} \log_2 2^3 = 6$

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⑦

$x^{\log_2 x} = 16x \rightarrow y^{\log_2 y} = 2^4 \rightarrow \log_2 y^{\log_2 y} = \log_2 2^4 \rightarrow (\log_2 y)^2 = 4 \rightarrow \log_2 y = \pm 2$

$y = 4 \rightarrow x = 4$

$y = \frac{1}{4} \rightarrow x = \frac{1}{4}$

جواب ← (3) $\frac{y}{x} = \frac{4}{\frac{1}{4}} = 16$

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⑧

$\log_{x^2+x} 8 = \frac{\log_2 8}{\log_2 (x^2+x)} = \frac{3}{\log_2 (x^2+x)}$

$\log_2 (x^2+x) = 1 \rightarrow x^2+x = 2 \rightarrow x^2+x-2=0 \rightarrow (x+2)(x-1)=0$

$x=-2$ (غ ق ق) $\quad x=1$ (ق ق)

$\log_{1^2+1} 8 = \log_2 8 = 3$

جواب ← (3)

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⑨

$\log_{12} 6 = \log_{2^2 \times 3} 2 \times 3 \rightarrow \log_{2^2 \times 3} 2^2 \times 3^2 = \log_{2^2 \times 3} (2^2 \times 3)^2 = 2$

$\log_{2^2} 10^{0.7} = 3 \rightarrow 10^{0.7} = 2^3$

$\frac{7}{10} \times 2 = 3$

$\frac{7}{10} \times 2 = 3$

جواب ← (2) $\log_{\frac{5}{3}} \frac{5}{3} = 1$

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⑩

$(a \log 2) x^2 + ax + b \log 2 = 0 \xrightarrow{x=-1} a \log 2 - a + b \log 2 = 0$

$\log 2 (a+b) = a \rightarrow \log_{10} 2 = \frac{a}{a+b} \rightarrow \log_2 10 = \frac{a+b}{a} \rightarrow \log_2 5 + \log_2 2 = 1 + \frac{b}{a}$

$\log_2 5 = \frac{b}{a} \rightsquigarrow (\sqrt{2})^{\frac{b}{a}} = 2^{\log_2 5} \rightarrow 5^{\frac{1}{2}} = \sqrt{5}$

جواب ← (5) $\sqrt{5}$