نام و نام خانوادگی ....ترنم ایران........ پاسخنامه تشریحی تکلیف شماره ...۲۴... کلاس ....A..........

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$F(x) = 3^{Ax+B}$

$\hookrightarrow x=1 , y=1^2 \to y=1 \to (1,1)$

$\hookrightarrow x=3 , y=3^2 \to y=9 \to (3,9)$

$3^{A(1)+B} = 1 \to 3^0 = 1 \to A+B=0 \to B=-A$ ، $3^2 = 9 \to 3A+(-A)=2 \to 2A=2 \to \boxed{A=1}$, $\boxed{B=-1}$

$F(0) = 3^{0-1} = 3^{-1} \to \boxed{F(0)=1/3}$

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$\log_2(4^x+15) = x+3$

$4^x+15 = 2^{x+3} \to 4^x+15 = 8\cdot 2^x \to (2^x)^2 - 8(2^x)+15=0$, $4^x = (2^2)^x$, $t = 2^x$

$t^2 - 8t + 15 = 0 \to (t-3)(t-5)=0 \to t=3 , t=5$

$\to x_1 = \log_2 3 = 2^x = 3$

$\to x_2 = \log_2 5 = 2^x = 5 \to S = x_1+x_2 \to \log_2 3 + \log_2 5 \Rightarrow \log_2 15$

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$(\log_{21} 3)^2 + \log_{21}(147) \log_{21}(1323)$, $147 = 3\times 7^2$, $1323 = 3^3\times 7^2$

$\log_{21} 7 = b$, $\log_{21} 3 = a$ و $b = 1-a \to a+2b = a+2(1-a) = 2-a$

$3a+2b = 3a+2(1-a) = a+2$

$147 = a+2b$ ، $1323 = 3a+2b$

$A = a^2+(a+2b)(3a+2b) \to A = a^2 + \underbrace{(2-a)(2+a)}_{4-a^2} = \text{(4)}$

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$\log(\underbrace{x^2-2x+1}_{(1-x)^2}) + 3\log(1-x) = 5 \Rightarrow \log(1-x)^2 + 3\log(1-x) = 5$

$\hookrightarrow 5\log(1-x) = 5 \to \log(1-x) = 1$

$\Rightarrow 1-x = 10^1 \to \boxed{x=-9}$

$\log_3(-x)$

$\hookrightarrow \log_3(-(-9)) = \log_3 3^2 = \text{(2)}$

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$\log_2(x^2+2x+4) + \log_2(x-2) = 3 \to \log_2[(x^2+2x+4)(x-2)] = 3$, x^3-8

$\hookrightarrow \log_2(x^3-8) = 3 \to 2^3 = x^3-8$

$\Rightarrow 8 = x^3-8 \to x^3 = 16$

$\log_{\sqrt[3]{2}} x$, $\sqrt[3]{2} \to 2^{1/3}$

$\frac{1}{1/3}\log_2 x \Rightarrow 3\log_2 x \to \log_2 x^3 \to \log_2 16 \to \log_2 2^4 = \text{(4)}$

$2-x>0 \rightarrow x<2$ $\log(2-x) - \log\frac{1}{(x-2)^2} = 3$ $(x-2)^2 \neq 0 \rightarrow x \neq 2 \rightarrow \log(x-2)^{-2} \Rightarrow -2\log\lvert x-2\rvert$ $\Rightarrow \log\frac{1}{(x-2)^2} = -2\log(2-x)$ $\Rightarrow \log(2-x) - [-2\log(2-x)] = 3$ $= \log(2-x) + 2\log(2-x) = 3 \rightarrow 3\log(2-x) = 3 \rightarrow \log(2-x) = 1$ $\Rightarrow 2-x = 10 \rightarrow -x = 8 \rightarrow x = -8$ (جواب) $\log_{\sqrt{2}}(-x)$ $\log_{\sqrt{2}} 8$, $8 \rightarrow 2^3$, $\sqrt{2} \rightarrow 2^{1/2}$ $\Rightarrow \frac{3}{\frac{1}{2}}\log_2 2 = 3\times 2 = 6$	۶
$3^{x^2-2} = 81^x \Rightarrow 3^{x^2-2} = 3^{4x} \Rightarrow x^2-2 = 4x \Rightarrow x^2-4x-2 = 0$ $\Rightarrow \Delta = b^2-4ac \Rightarrow (-4)^2-4(1)(-2) = 16+8 = 24$ $x = \frac{4\pm\sqrt{24}}{2} = \frac{4\pm 2\sqrt{6}}{2} = 2\pm\sqrt{6} \Rightarrow x = 2\pm\sqrt{6} \Rightarrow x-2 = \pm\sqrt{6}$ به علت Log باید + باشد <= $x-2=\sqrt{6}$ ق‍ق $\log_6(x-2)$ $\Rightarrow \log_6\sqrt{6}$, $\sqrt{6} \rightarrow 6^{1/2}$ $\Rightarrow \frac{1}{2}\log_6 6 = \frac{1}{2}$	۷
$\log_3 2 = \frac{5}{8}$ $\log_{18} 8 = ? \rightarrow \frac{\log_3 8}{\log_3 18} = \frac{3\log_3 2}{\log_3 2 + \log_3 3^2} \Rightarrow \frac{3\times(\frac{5}{8})}{\frac{5}{8}+2} = \frac{\frac{15}{8}}{\frac{21}{8}} = \frac{5}{7}$ $18 = 2\times 3^2$	۸
$\log_4 3 = 0/8 \Rightarrow \frac{1}{2}\log_2 3 = 0/8 \rightarrow \log_2 3 = 1/6 = \frac{8}{5}$ ($4 \rightarrow 2^2$) $\log_{12} 6 = ? \quad \frac{\log_2 6}{\log_2 12} = \frac{\log_2 2 + \log_2 3}{\log_2 2^2 + \log_2 3} = \frac{1+\log_2 3}{2+\log_2 3} = \frac{\frac{13}{5}}{\frac{18}{5}} = \frac{13}{18}$	۹
$(a\log 2)x^2 + ax + b\log 2 = 0 \xrightarrow{x=-1} (a\log 2)(-1)^2 + (a)(-1) + b\log 2 = 0$ $a\log 2 - a + b\log 2 = 0$ یا $a\log 2 + b\log 2 = a$ $(a+b)\log 2 = a \rightarrow \frac{a+b}{a}\log 2 = 1$ $\Rightarrow (1+\frac{b}{a})\log 2 = 1 \rightarrow \log 2^{(1+\frac{b}{a})} = 1$ $\Rightarrow 2^{(1+\frac{b}{a})} = 10^1 \Rightarrow 2\times 2^{\frac{b}{a}} = 10 \rightarrow 2^{\frac{b}{a}} = 5$ $(\sqrt{2})^{\frac{b}{a}} \Rightarrow (2^{\frac{1}{2}})^{\frac{b}{a}} = (2^{\frac{b}{a}})^{\frac{1}{2}}$, $5^{\frac{1}{2}} = \sqrt{5}$	۱۰