نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ۲۰ ..... کلاس ۲۴ .....

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$x=1 \rightarrow y=(1)^2=1=2^{A+B} \rightarrow A+B=0$

$x=2 \rightarrow y=(2)^2=2^{2A+B} \rightarrow 2A+B=2$

$\Rightarrow 2A=2 \rightarrow A=1 \Rightarrow B=-1$

$\rightarrow f(x)=2^{x-1}$ ⇒ نمودی تابعی با کدوم‌ها → $x=0 \Rightarrow f(0)=2^{-1}=\frac{1}{2}$ $\left(0,\frac{1}{2}\right)$

گزینه ۲

۲

$\log_2^{(4^x+10)} = x+2 \Rightarrow 4^x+10=2^{(x+2)}=2^{2x}+10=2^x\times 2^2 \xrightarrow{2^x=A} A^2+10=8A$

$\Rightarrow A^2-8A+10=(A-5)(A-2) \rightarrow \begin{cases} A=2=2^x \rightarrow x=\log_2^2 \\ A=5=2^x \rightarrow x=\log_2^5 \end{cases} \Rightarrow \log_2^3+\log_2^5=\log_2^{15}$

گزینه ۲

۳

$\log_{21}^{147}=\log_{21}^{3\times 7}=\log_{21}^3+\log_{21}^7=1+\log_{21}^7 \longrightarrow \log_{21}^7=\log_{21}^{\frac{21}{3}}=\log_{21}^{21}-\log_{21}^3=1-\log_{21}^3$

$\Rightarrow \log_{21}^{147}=1+1-\log_{21}^3=2-\log_{21}^3$

$\log_{21}^{1323}=\log_{21}^{3^2\times 7^2}=2\log_{21}^3+\log_{21}^7=2+\log_{21}^3$

$\rightarrow (\log_{21}^{147})(\log_{21}^{1323})=(2-\log_{21}^3)(2+\log_{21}^3)=4-(\log_{21}^3)^2 \rightarrow (\log_{21}^3)^2+4-(\log_{21}^3)^2=4$

گزینه ۲

۴

$x^2-2x+1=(x-1)^2=(1-x)^2 \rightarrow \log^{x^2-2x+1}=\log^{(1-x)^2}=2\log^{(1-x)}$

$\rightarrow 2\log^{(1-x)}+3\log^{(1-x)}=5\log^{(1-x)}=5 \rightarrow \log^{(1-x)}=1 \rightarrow 1-x=10 \rightarrow x=-9$

$\rightarrow \log_3^{-x}=\log_3^9=2$

گزینه ۲

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$\log_2^{(x^2+2x-8)}+\log_2^{(x-2)}=\log_2^{(x^2+2x+4)(x-2)}$

$\rightarrow (x^2+2x+4)(x-2)=x^3+2x^2+4x-4x^2-8x-8=x^3-4x-8$

$\rightarrow \log_2^{(x^3-8)}=3 \rightarrow x^3-8=2^3=8 \rightarrow x^3=16 \rightarrow x=\sqrt[3]{16}=2^{\frac{4}{3}}$

$\log_{\sqrt[3]{2}}^{x}=\log_{2^{\frac{1}{3}}}^{2^{\frac{4}{3}}}=\frac{\frac{4}{3}}{\frac{1}{3}}\log_2^2=4$

گزینه ۲

۶

$\log \frac{1}{(2-x)^2} = \log \frac{1}{(2-x)^{-1}} = \log (2-x)^{-2} = -2\log(2-x)$

$\rightarrow \log(2-x) + 2\log(2-x) = 3\log(2-x) = 3 \rightarrow \log(2-x) = 1 \rightarrow 2-x = 10 \rightarrow x = -8$

$\log_{\sqrt{2}}^{-8} = \log_{\sqrt{2}}^{8} = \frac{6}{\frac{1}{2}}\log_2^2 = 4$

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$3^{x^2-2} = (3^4)^x = 3^{4x} \rightarrow x^2 - 2 = 4x \rightarrow x^2 - 4x - 2 = 0$

$\rightarrow \Delta = 16 - 4(-2) = 16 + 8 = 24 \rightarrow x = \frac{4 \pm 2\sqrt{6}}{2} = 2 \pm \sqrt{6}$

$\log_4^{(2-\sqrt{6}-2)} \rightarrow$ تعریف نشده

$\log_4^{(2+\sqrt{6}-2)} = \log_4^{\sqrt{6}} = \frac{1}{2}$

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$\log_8^{12} = \log_8^9 + \log_8^2 = \frac{2}{3}\log_2^3 + \frac{1}{3}\log_2^2 = \frac{2}{3}\log_2^3 + \frac{1}{3}$

$\rightarrow \log_{10}^2 = \frac{3}{8} \Rightarrow \log_2^3 = \frac{1}{\log_{10}^2} = \frac{8}{3} \rightarrow \frac{2}{3}\log_2^3 + \frac{1}{3} = \frac{2}{3} \times \frac{8}{3} + \frac{1}{3} = \frac{16+3}{15} = \frac{19}{15} = \frac{7}{5}$

$\rightarrow \log_8^{18} = \frac{7}{5} \Rightarrow \log_{18}^8 = \frac{1}{\log_8^{18}} = \frac{5}{7}$

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$\log_6^{30} = \frac{1}{2}\log_2^{30} = 0,8 \rightarrow \log_2^3 = 1,9$

$\log_{12}^4 = \frac{\log_2^4}{\log_2^{12}} = \frac{\log_2^3 + \log_2^2}{\log_2^{10} + \log_2^4} = \frac{\log_2^3 + 1}{\log_2^2 + 2\log_2^2} = \frac{1,9+1}{1,9+2} = \frac{2,9}{3,9} = \frac{29}{39} = \frac{14}{18}$

۱۰

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

$\rightarrow 2^{(a+b)} = 10^a \rightarrow \log_2^{10^a} = a\log_2^{10} = a+b \Rightarrow \log_2^{10} = \frac{a+b}{a} = 1 + \frac{b}{a}$

$\rightarrow 10 = 2^{(1+\frac{b}{a})} = 2^1 \times 2^{(\frac{b}{a})} \Rightarrow 2^{(\frac{b}{a})} = \frac{10}{2} = 5 \rightarrow (\sqrt{2})^{\frac{b}{a}} = (2)^{\frac{1}{2}\frac{b}{a}} = (2^{\frac{b}{a}})^{\frac{1}{2}} = (5)^{\frac{1}{2}} = \sqrt{5}$