۲۴ تمرین صفحه ۱ - یافت B یازدهم دفتر — Subject — Date: — مبانی درون — ۲۰

۱-
$f(x) = 3^{Ax+B}$ $\quad y = x^2$ $\quad x = 1, 3$

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

(د)

$f(3) = 3^{3A+B}$, $x=3 \to y=9 \quad 3^{3A+B} = 9 \quad 3A+B=2$

$A=1 , B=-1 \quad f(x) = 3^{x-1} \longrightarrow x=0 \to 3^{-1} = \frac{1}{3}$

۲-
$\log_2^{4^x+15} = x+3 \to 2^{x+3} = 4^x + 15 \to 2^x \cdot 8 = (2^x)^2 + 15$ (د)

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

$t = 3, 5 \to 2^x = 3 \to x = \log_2^3$, $x = \log_2^5$ $\Rightarrow \log_2^3 + \log_2^5 = \log_2^{15}$

۳-
$(\log_{21}^3)^2 + \log_{21}^{147} \times \log_{21}^{1323}$

$\log_{21}^{147} = \log_{21}^{21} + \log_{21}^{7} = 1 + \log_{21}^{7}$ $\quad \log_{21}^{1323} = \log_{21}^{21^2} + \log_{21}^{3} =$ (د)

$1 + \log_{21}^{\frac{21}{3}} = 1 + \log_{21}^{21} - \log_{21}^{3} = 2 - \log_{21}^{3}$ $\quad 2 + \log_{21}^{3}$

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

۴-
$\log_{10}^{x^2-2x+1} + 3\log(1-x) = 5 \to (x^2-2x+1)(1-x)^3 = 10^5$

$(1-x)^2 (1-x)^3 = 10^5 \to (1-x)^5 = 10^5 \to 1-x = 10 \to x = -9$ (د)

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

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۵- $\log_2^{x^2+2x+4} + \log_2^{x-2} = 3 \to (x^2+2x+4)(x-2) = 2^3$ ۴

$x^3 - 8 = 8 \to x^3 = 16 \to x = \sqrt[3]{16}$　　$\log_{\sqrt[3]{2}}^{x} = \log_{\sqrt[3]{2}}^{\sqrt[3]{16}} =$

$\frac{\cancel{1/3}}{\cancel{1/3}} \log_2^{16} = \log_2^{16} = \boxed{4}$

۶- $\log(2-x) - \log\frac{1}{(x-2)^2} = 3 \to \log^{2-x} + \log(x-2)^2 = 3$

$(x-2)^2 = (2-x)^2 \to \log(2-x)(2-x)^2 = 3 \to (2-x)^3 = 10^3$ ۲

$2-x = 10 \to x = -8 \to \log_{\sqrt{2}}^{+8} = \log_{2^{\frac12}}^{2^3} = \frac{3}{\frac12}\log_2^2 = \boxed{6}$

۷- $3^{x^2-2} = 81^x$, $3^{x^2-2} = 3^{4x} \to x^2-2 = 4x$ ۲

$x^2 - 4x - 2 = 0 \to x = 2 \pm \sqrt{6} \to 2-\sqrt{6}$ ✗ → چون غ ق ق
منفی می‌شود

$\log_6^{x-2} = \log_6^{2+\sqrt{6}-2} = \log_6^{\sqrt{6}} = \frac12 \log_6^6 = \boxed{\frac12}$

۸- $\log_3^2 = \frac58$　　$\log_{18}^{8} = ?$ ۲

$\log_{18}^8 = \frac{\log_3^8}{\log_3^{18}} = \frac{3\log_3^2}{\log_3^9 + \log_3^2} = \frac{3 \times \frac58}{2 + \frac58} = \frac{15}{21} = \boxed{\frac57}$

۹- $\log_4^3 = 0.8$　　$\log_{12}^{6} = ?$　　$\log_{12}^6 = \frac{\log_4^6}{\log_4^{12}} = \frac{\log_4^3 + \log_4^2}{\log_4^3 + \log_4^4} =$

$\frac{0.8 + \frac12}{0.8 + 1} = \frac{\frac{13}{\cancel{10}}}{\frac{18}{\cancel{10}}} = \boxed{\frac{13}{18}}$ ۲

$(a\log 2)x^2 + ax + b\log 2 = 0 \qquad x = -1 \,, \qquad (\sqrt{2})^{\frac{b}{a}}$ -۱۰

۳

$x = -1 \to a\log 2 - a + b\log 2 = 0 \to \log 2 = \frac{a}{a+b} \Rightarrow \log_2 10 = 1 + \frac{b}{a}$

$\log_2 10 - 1 = \frac{b}{a} \to \log_2 10 - \log_2 2 = \frac{b}{a} \to \log_2 5 = \frac{b}{a}$

$(\sqrt{2})^{\frac{b}{a}} = (2^{\frac{1}{2}})^{\log_2 5} \xrightarrow[\text{عوض کردن}]{} (5^{\frac{1}{2}})^{\log_2 2} = (\sqrt{5})^1 = \boxed{\sqrt{5}}$