۱- $f(x)=2^{Ax+B}$ $\quad y=x^2$ (۱۷) $\quad (x_1,y_1)\to y_1=1$ (صدراتم اصلی) $\quad 1=2^{A+B}$ $\quad A+B=0$

$(x_2,y_2)\to y_2=4$ $\quad 4=2^{2A+B}$ $\quad 2A+B=2$ $\quad$ (۱)

$\boxed{A=2}$ $\quad \boxed{B=-2}$

$f(0)=2^{-2}=\boxed{\frac{1}{4}}$

نقاط تلاقی یک وسه هستند!

۲- $\log_2(4^x+15)=x+3$ $\quad 4^x+15=2^{x+3}$ $\quad 2^x\times 2^3=(2^x)^2+15$ $\quad$ (۱,۵)

$8k=k^2+15$ $\quad k^2-8k+15=0$ $\quad 64-60=4$

$\frac{8+2}{2}=\boxed{5}$ $\quad \frac{8-2}{2}=\boxed{3}$ $\quad$ ~~$\boxed{8}$~~

$K=2^x \leftarrow$ حواست باشه!

$x=\log_2 3$ $\quad$ جمع ریشه $\to \log_2 15$

$x=\log_2 5$

۳- $(\log_{21}3)^2+\log_{21}147\times\log_{21}1323$ $\quad (2+\log_{21}3)(2-\log_{21}3)=4-(\log_{21}3)^2$ $\quad$ (۲)

$\boxed{4=\text{جواب}}$ ✓

$(\log_{21}21+\log_{21}7)\times(\log_{21}21+\log_{21}21+\log_{21}3)$

$\log_{21}\frac{21}{3}\to\log_{21}21-\log_{21}3$

۴- $\log(x^2-2x+1)+3\log(1-x)=0$ $\quad \log_3(-x)=?$ $\quad \log(81-x)=k$ $\quad$ (۲)

$(x-1)^2$

$\log(1-x)^5=5\to 10^5=(1-x)^5\to 1-x=10\to \boxed{x=-9}$ ✓ $\boxed{\log_3 9=2}$ ✓

۵- $\log_2(x^2+2x+4)+\log_2(x-2)=3$ $\quad \log_2(x^2+2x+4)(x-2)=3\to\log_2 x^3-8=3$ $\quad$ (۲)

$x^3-8=8\to x^3=16\to x=\sqrt[3]{16}$ $\quad \log_{\sqrt[3]{2}}\sqrt[3]{16}=\boxed{4}$ ✓

۶- $\log(20-x)-\log\frac{1}{(x-2)^2}=3$ $\quad 3\log(2-x)=3$ $\quad \log(2-x)=1$ $\quad$ (۲)

$\hookrightarrow +2\log(20-x)+\log(2-x)=3$ $\quad 2-x=10$ $\quad \boxed{x=-8}$ ✓

$\log_{\sqrt{2}}(-x)=\log_{\sqrt{2}}8=\boxed{6}$ ✓

۷- $3^{x^2-2}=81^x$ $\quad \log_6(x-2)=?$ $\quad 3^{x^2-2}=3^{4x}$ $\quad x^2-2=4x$ $\quad$ (۲)

$x^2-4x-2=0$

$x=2\pm\sqrt{6}$

$\log_6\sqrt{6}-2+2=\log_6\sqrt{6}=\boxed{\frac{1}{2}}$ ✓

۸- $\log_3 2=\frac{5}{8}$ $\quad \log_{18}8=?\to 3\log_{18}2\to\frac{3\log_3 2}{\log_3 18}=\frac{3\log_3 2}{6+3\log_3 2}=\frac{\log_3 2}{2+\log_3 2}$ $\quad$ (۰,۵)

$\hookrightarrow 3\log_3 6+3\log_3 2$

یکبار ۳ روضرب میکنن

$\frac{\frac{5}{8}}{\frac{21}{8}}=\boxed{\frac{5}{21}}$

-۹ (۲)

$\log_4^3 = 0/8$ $\quad \log_{12}^{?} = ? \rightarrow \log_{12}^{3} + \log_{12}^{?} = \frac{0/8}{1+0/8} + \frac{0/5}{1/8} = \frac{1/3}{1/8} = \boxed{\frac{13}{18}}$ ✓

$\frac{\log_4^3}{\log_4^{12}} \rightarrow \frac{\log_4^3}{1+\log_4^3}$

$\log_4^{2} = 0/5$

$1/8 \quad \log_4^{12}$

-۱۰ (۲)

$(a\log 2)x^2 + ax + b\log 2 = 0 \qquad x_1 = -1 \qquad (\sqrt{2})^{\frac{b}{a}}$

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

$(a+b) = \frac{a}{\log 2} \rightarrow b = \frac{a}{\log 2} - a \rightarrow \frac{b}{a} = \frac{1}{\log 2} - 1 \qquad \frac{1}{2}\left(\frac{1}{\log 2} - 1\right) \qquad \frac{1}{2}(\log_2^{10} - 1)$

$\leftarrow \sqrt{10} \times \frac{1}{\sqrt{2}} = \boxed{\sqrt{5}}$ ✓ $\quad 2^{\frac{1}{2}\log_2^{10}} \times 2^{-\frac{1}{2}} \leftarrow$

-۱

$x = 1 \rightarrow 1^2 = 3^{A+B} \rightarrow A + B = 0$

$x = 3 \rightarrow 3^2 = 3^{3A+B} \rightarrow 3A + B = 2$

$\rightarrow \begin{cases} A = 1 \\ B = -1 \end{cases}$

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

-۸

$\log_{18}^{8} = \frac{\log_3^8}{\log_3^{18}} = \frac{3\log_3^2}{2 + \log_3^2} = \frac{3 \times \frac{5}{8}}{2 + \frac{5}{8}} = \boxed{\frac{5}{7}}$

$\log_3^{3^2} + \log_3^2$

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