1 -

$f(x)=2^{Ax+B}$ $\quad y=x^2$

$(1,y_1)\to y_1=1$ (عرض ها) $\quad 1=2^{A+B}$ $\quad A+B=0$

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

$A=2$ $\quad B=-2$

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

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2 -

$\log_2(4^x+15)=x+3$ $\quad 4^x+15=2^{x+3}$ $\quad 2^x\times 2^3=(2^x)^2+15$

$2^x=k$ $\quad 8k=k^2+15$ $\quad k^2-8k+15=0$

$64-60=4$

$\frac{8\pm 2}{2}=5,\ 3$ $\quad$ ضرب $=15$

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3 -

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

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

جواب $=4$

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

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

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4 -

$\log(x^2-2x+1)+3\log(1-x)=5$ $\quad \log_3(-x)=?$ $\quad \log(1-x)=k$

$(x-1)^2$

$\log(1-x)^5=5\to 10^5=(1-x)^5\to 1-x=10\to x=-9$ $\quad \log_3 9=2$

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5 -

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

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

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6 -

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

$\hookrightarrow +2\log(2-x)+\log(2-x)=3$ $\quad 2-x=10$ $\quad x=-8$

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

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7 -

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

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

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

$\log_6(\sqrt{6}-2+2)=\log_6\sqrt{6}=\frac{1}{2}$

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8 -

$\log_3 2=\frac{5}{8}$ $\quad \log_{18}8=?\to 3\log_{18}2\to\frac{3\log_3 2}{3\log_3 18}=\frac{3\log_3 2}{6+3\log_3 2}=\frac{\log_3 2}{2+\log_3 2}$

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

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

$\log_4 3 = 0/8$ ۹-

$\log_{12} 2 = ? \rightarrow \log_{12} 3 + \log_{12} 2 = \frac{0/8}{1+0/8} + \frac{0/5}{1/8} = \frac{1/3}{1/8}$

$\log_{12} 3 = \frac{\log_4 3}{\log_4 12}$

$\log_4 12 = 1 + \log_4 3$

$\log_{12} 2 = \frac{\log_4 2 = 0/5}{1/8}$

$\frac{13}{18}$

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

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

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

$2^{\log_2 10} = 10 \quad \log_5 4$

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