(1) (۲)

$x_1=1 \xrightarrow{f} y_1=1$

$x_2=3 \xrightarrow{f} y_2=9$

$f(1)=1 \longrightarrow 3^{A+B}=3^0 \longrightarrow A+B=0$

$f(3)=9 \longrightarrow 3^{3A+B}=3^2 \longrightarrow 3A+B=2$

$\Rightarrow A=1, B=-1 \Rightarrow f(x)=3^{x-1} \xrightarrow{x=0} f(0)=\frac{1}{3}$ ✓

گزینه ۲ با محور yها

(2) (۲)

$\log_3^{4^x+15}=x+3$

$4^x+15=3^{x+3}$

$4^x+15=3^x\cdot 27$

$a^2-27a+15=0$

$(a-3)(a-5)=0$

$a=3 \Rightarrow 3^x=3 \Rightarrow x_1=\log_3^3$

$a=5 \Rightarrow 3^x=5 \Rightarrow x_2=\log_3^5$

$\Rightarrow x_1+x_2=\log_3^{15}$ ✓

(3) (۲)

$(\log_{\sqrt{3}}^3)^2+\log_{\sqrt{3}}^{144}\log_{\sqrt{3}}^{1323}$

$(\log_{\sqrt{3}}^3)^2+(\log_{\sqrt{3}}^{441}-\log_{\sqrt{3}}^3)(\log_{\sqrt{3}}^{441}+\log_{\sqrt{3}}^3)=(\log_{\sqrt{3}}^{441})^2=4$ ✓

(4) (۲)

$\log^{x^2-2x+1}+3\log^{1-x}=5$

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

$x=-9 \rightarrow \log_c^9=2$ ✓ ✓

(5) (۲)

$\log_2^{x^2+2x+4}+\log_2^{x-2}=3$

$\log_2^{x^3-8}=3 \Rightarrow x^3-8=8 \Rightarrow x^3=16 \Rightarrow x=2\sqrt[3]{2}$ ✓

$\longrightarrow \log_{2^{\frac{1}{3}}}^{2\sqrt[3]{2}}=4$ ✓

(6) (۲)

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

$\rightarrow \log^{-(x-2)^3} = 3 \rightarrow x-2 = -10 \Rightarrow x = -8 \rightarrow \log_{\frac{1}{2}}^{8} = \boxed{9}$ ✓

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(7) (۲)

$3^{x^2-2} = 3^{4x} \rightarrow x^2 - 4x - 2 = 0 \rightarrow (x-2)^2 - 6 = 0$

$\rightarrow x-2 = \pm\sqrt{6} \rightarrow \log_{9}^{x-2} = \xrightarrow{x-2>0} \log_{9}^{\sqrt{6}} = \boxed{\frac{1}{2}}$ ✓

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(8) (۲)

$\log_{3}^{2} = \frac{5}{8} \rightarrow \log_{2}^{3} = \frac{8}{3}$

$\log_{12}^{8} = \frac{\log_2^8}{\log_2^{12}} = \frac{3}{1+\frac{2}{3}} = \frac{3}{\frac{5}{2}} = \boxed{\frac{5}{7}}$ ✓

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(9) (۲)

$\log_{4}^{3} = 0/8 \rightarrow \log_{2}^{3} = 1/6$

$\log_{12}^{6} = \frac{\log_2^6}{\log_2^{12}} = \frac{1+1/6}{2+1/6} = \frac{2/6}{3/6} = \boxed{\frac{13}{18}}$ ✓

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(10) (۲)

$(a \cdot \log 2)x^2 + ax + b\log 2 = 0 \xrightarrow{\alpha} x = -1$

$\rightarrow a\log^2 - a + b\log 2 = 0 \rightarrow \log^2 = 1 + \frac{b}{a}\log^2 = 1 - \log^2 \log^{10}$

$\rightarrow \frac{b}{a} = \frac{\log^1}{\log^2} = \log_2^5 \rightarrow (\sqrt{2})^{\log_2^5} = 5^{\log_2^{\sqrt{5}}} = \boxed{\sqrt{5}}$ ✓