نام و نام خانوادگی ...ابوالفضل ابوفاضلی... پاسخنامه تشریحی تکلیف شماره ...۲۴... کلاس ...یازدهم...

۲۰

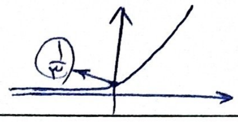
۱ (۲)

$$y = x^2 \longrightarrow \begin{cases} x=1 \Rightarrow y=1 \\ x=3 \Rightarrow y=9 \end{cases}$$

$$3^{Ax+b} = \begin{cases} x=1 \longrightarrow y=1 \Rightarrow A+b=0 \\ x=3 \longrightarrow y=9 \Rightarrow 3A+b=2 \end{cases}$$

$$2A = 2 \longrightarrow A=1,\ b=-1 \Rightarrow f(x) = 3^{x-1}$$

$$\xrightarrow{x=0} 3^{(0)-1} = 3^{-1} = \frac{1}{3}$$ → عرض از مبدا



۲ (۲)

$$\log_2^{4^x+15} = x+3 \Rightarrow 2^x \times 8 = \underbrace{4^x}_{2^{2x}} + 15 \Rightarrow (2^x)^2 - 8(2^x) + 15 = 0$$

$$\Rightarrow (2^x-5)(2^x-3) = 0 \Rightarrow \begin{cases} 2^x = 5 \Rightarrow x = \log_2^5 \\ 2^x = 3 \Rightarrow x = \log_2^3 \end{cases}$$

$$\Rightarrow \log_2^5 + \log_2^3 = \log_2^{15}$$

۳ (۲)

$$(\log_{21}^3)^2 + \log_{21}^{147} \log_{21}^{147\times 9} = (\log_{21}^3)^2 + \log_{21}^{147}(\log_{21}^{147} + 2\log_{21}^3)$$

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

$$= (\log_{21}^{3\times 7\times 7\times 3})^2 = (\log_{21}^{(21)^2})^2 = (2\log_{21}^{21})^2 = 4$$

۴ (۲)

$$\log_{10}^{(x-1)^2 \times (1-x)^3} = 5 \Rightarrow (x-1)^2 \times -(x-1)^3 = -(x-1)^5 = 10^5$$

$$\Rightarrow x-1 = -10 \longrightarrow x = -9$$

$$\log_3^9 = 2$$

۵ (۲)

$$\log_2^{(x^2+2x+4)\times(x-2)} = 3 \Rightarrow x^3 - \cancel{2x^2} + \cancel{2x^2} - \cancel{4x} + \cancel{4x} - 8 = 8$$

$$\Rightarrow x^3 = 16 \Rightarrow x = \sqrt[3]{16} = \sqrt[3]{2^4} = 2^{\frac{4}{3}}$$

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

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

$\log_{10}^{2-x} = 1 \to 2-x = 10 \to x = -8$ ✓ ۶

$\log_{\sqrt{2}}^{(-x)} = \log_{\sqrt{2}}^{8} = \log_{2^{\frac{1}{2}}}^{2^3} = \frac{3}{\frac{1}{2}} \times \log_2^2 = 6$ ✓

$3^{x^2-2} = 3^{4x} \to x^2-2 = 4x \to x^2-4x-2 = 0 \Rightarrow x = \begin{cases} \frac{4+\sqrt{24}}{2} = 2+\sqrt{6} \checkmark\checkmark \\ \frac{4-\sqrt{24}}{2} = 2-\sqrt{6} \ \text{غ ق ق} \ \times \end{cases}$ ۲

$\log_6^{x-2} = \log_6^{(2+\sqrt{6}-2)} = \log_6^{\sqrt{6}} = \frac{1}{2}$ ✓ ۷

$\log_3^2 = \frac{5}{8} \to \log_2^3 = \frac{8}{5}$

$\log_{18}^{8} = 3\underbrace{\log_{18}^{2}}_{A} = 3A \Rightarrow \log_2^{18} = \frac{1}{A} \Rightarrow \frac{1}{A} = \log_2^{3\times3\times2} = \overset{\frac{8}{5}}{\log_2^3} + \overset{\frac{8}{5}}{\log_2^3} + \cancel{\log_2^2}$ ۲ ۸

$\Rightarrow \frac{1}{A} = \frac{21}{5} \Rightarrow A = \frac{5}{21} \Rightarrow \log_{18}^{2} = \frac{5}{12} \Rightarrow 3\log_{18}^{2} = \log_{18}^{8} = \cancel{3}\times\frac{5}{\cancel{21}_{7}} = \frac{5}{7}$ ✓

$\log_4^3 = 0.8 \Rightarrow \frac{1}{2}\log_2^3 = 0.8 \to \log_2^3 = 1.6$ ۲

$\log_{12}^{6} = \frac{\log_2^6}{\log_2^{12}} = \frac{\log_2^{2\times3}}{\log_2^{2\times2\times3}} = \frac{\log_2^2 + \log_2^3}{\log_2^2 + \log_2^2 + \log_2^3} = \frac{1+1.6}{1+1+1.6} = \frac{2.6}{3.6} = \frac{13}{18}$ ✓ ۹

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

$\Rightarrow \log 2\,(a+b) - a = 0 \to \log 2 = \frac{a}{a+b} \to \log_2^{10} = \frac{a+b}{a} = 1 + \frac{b}{a}$ ۲

$2^{\frac{a+b}{a}} = 2^{1+\frac{b}{a}} = 2\times 2^{\frac{b}{a}} = 10 \to 2^{\frac{b}{a}} = 5 \Rightarrow (\sqrt{2})^{\frac{b}{a}} = 5^{\frac{1}{2}} = \sqrt{5}$ ✓ ۱۰