۱۴,۲۵

حلیا صفرزاده

-۱ $f'_{x=0} = y_0$ $\xrightarrow{x=0}$ $f(x) = 3^{2x-1}$ $\Rightarrow f(x) = 3^{Ax+B}$ $y = x^2$

حل ۰،۱ $\rightarrow y = x^2 \xrightarrow{x=1} 1^2 = y \rightarrow y = 1$ $(1,1)$

$Log\; y = x^2 \xrightarrow{x=3} 9 = y$ $(3,9)$ ۵ نقطه تلاقی f با منحنی y ها؟

نقطه (1,1) $\rightarrow f(x) = 3^{A+B} \rightarrow A+B=0 \rightarrow A=-B$ / $A=1$ / نقطه (3,9) $\rightarrow 9 = 3^{3A+B} \rightarrow 3A+B=2$ $-2B=2$ $B=-1$

-۲ $\log_2^{(4^x+15)} = x+3$ $2^x = 5 \rightarrow \log_2^5 = x$ $2^x = 3 \rightarrow \log_2^3 = x$ $\log_2^5 + \log_2^3 = \log^{15}$ ۱,۷۵

$4^x + 15 = 2^{(x+3)} \rightarrow 2^{2x} + 15 = 2^{(x+3)}$

$2^{2x} - 8 \times 2^x + 15 = 0 \rightarrow t^2 - 8t + 15 = 0 \rightarrow (t-5)(t-3) = 0 \rightarrow t=5$ یا $t=3$

$(2^x)^2$ , $t$

-۳ حل $(\log_{21}^3)^2 + \log_{21}^{(147)} \cdot \log_{21}^{343} = (\log_{21}^3)^2 + 4 - (\log_{21}^3)^2 = 4$ ۶

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

$(1+\log_{21}^{7})(2+\log_{21}^3) = (2-\log_{21}^3)(2+\log_{21}^3) = 4-(\log_{21}^3)^2$

$(1+1-\log_{21}^3)$

-۴ $\log(x^2-2x+1) + 3\log^{(1-x)} = 5$ $\log_3^{(-x)} = \log_3^{(9)} = 2$ ۰

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

$2\log^{(1-x)}$ $\log_{10}^{1-x} = 1$

$1-x = 10 \rightarrow x = -9$

-۵ $\log_2^{x^2+2x+4} + \log_2^{(x-2)} = 2$ $\log_{\sqrt[3]{2}}^{x} - \log_{2^{\frac{1}{3}}}^{x} = \frac{1}{3}\log_2^x = 3\times 2 = 6$ ۰,۵

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

$x^3 = 16 \rightarrow x = 4$

$\log x = \sqrt[3]{16} \rightarrow \log_{\sqrt[3]{2}}^{\sqrt[3]{16}} = 4$

# حل تمرین

6- $\log(2-x) = \log\frac{1}{(x-2)^2} = 3$ $\qquad \log_{\sqrt{2}}^{-x}$ $\qquad$ (1,2)

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

$\log(2-x) - (-2\log(2-x)) = 3\log(2-x) = 3 \to \log(2-x) = 1 \to 2-x = 10$

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

7- $3^{x^2-2} = 81^x$ $\qquad \log_4(x-2) \geq 0 \to x \geq 3$

$= \log_4^{\sqrt{4}} = \frac{1}{2}$ (2)

$3^{x^2-2} = 3^{4x} \to x^2-2 = 4x \to x^2-4x-2 = 0 \xrightarrow{+4-4=0} x^2-4x-2+4-4=0$ $\quad +16$

$(x-2)^2 = 6 \xrightarrow{\text{رادیکال}} |x-2| = \sqrt{6} \to x-2 = \sqrt{6}$ $\qquad (x-2)^2-6=0$

طبق فرض $x \geq 3$

8- $\log_5 2 = \frac{a}{8} \to \log_2 5 = (\log_5 2)^{-1} = \frac{8}{a}$ $\quad \log_{18}8 = ?$ $\quad \frac{a}{7}$

$\log_{18}8 = \frac{\log_2 8}{\log_2 18} = \frac{3}{\log_2 3^2\times 2} = \frac{3}{1+2\log_2 3} = \frac{3}{4.2} = \frac{5}{7}$ (4)

$\frac{16}{5} = 3.2$

9- $\log_4 3 = 0.8$ $\qquad \log_{12}4 = ?$ $\quad 1.425$ (2)

$\log_4 3 + \log_4 4 = \log_4 12 \to \log_4 3 = ? \to \frac{1}{2}\log_2 3 = 0.8 \to \log_2 3 = \frac{8}{5}$

$0.8$ $\quad 0.625$ $\quad 1.425$

$\log_{12}4 = \frac{1}{\log_4 12} = \frac{1}{\log_4 3 + \log_4 4} = \frac{1}{\frac{1}{\log_3 4}+1} = \frac{13}{18}$

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

شیوه نرسیده ۱-

$P = -\frac{c}{a} = -\frac{b\log 2}{a\log 2} = \frac{-b}{a}$

حلیا جعفریان

۱۱۰

$\beta = -\frac{b}{a} \xrightarrow[x = -\frac{b}{a}]{\text{در معادله صدق می‌کند}} (-\frac{b}{a})^2 a\log 2 + -\frac{b}{a} \times a + b\log 2 = 0$

(د)

$\frac{b^2}{a}\log 2 - b + b\log 2 = 0 \rightarrow \log 2 (\frac{b^2}{a} + b) = b \xrightarrow{\div b} \log 2 (\frac{b}{a} + 1) = 1$

$\log 2 = \frac{1}{\frac{b}{a}+1} \xrightarrow{\text{معکوس}} \log_2 10 = \frac{b}{a} + 1 \rightarrow \log_2 10 - \log_2 2 = \frac{b}{a} \rightarrow \log_2 5 = \frac{b}{a}$

$\sqrt{2}^{\frac{b}{a}} = \sqrt{2}^{\log_2 5} = 5^{\log_2 \sqrt{2}} = 5^{\frac{1}{2}} = \sqrt{5}$ (تعویض)