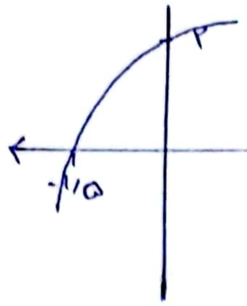
(۱

$y = 1 - \log_c (ax - b)$, $b + c = -\frac{3}{2}$, $(a+c)b = ?$



$f(-\frac{3}{2}) = 0 \rightarrow 0 = 1 - \log_c (-\frac{3}{2}a - b) \Rightarrow -\frac{3}{2}a - b = c \rightarrow$

$b + c = -\frac{3}{2}a \rightarrow \boxed{a = 1}$

$f(0) = 2 \rightarrow 2 = 1 - \log_c (-b) \rightarrow -\log_c (-b) = 1 \rightarrow \log_c (-b) = -1 \rightarrow$

$c^{-1} = -b \rightarrow -b = \frac{1}{c} \rightarrow \boxed{bc = -1}$

۲

$\begin{cases} b + c = -\frac{3}{2} \\ bc = -1 \end{cases} \rightarrow b = -\frac{1}{c}$, $2c(-\frac{1}{c} + c) = -\frac{3}{2} \times 2c \rightarrow -2 + 2c^2 = -3c \rightarrow 2c^2 + 3c - 2 = 0$

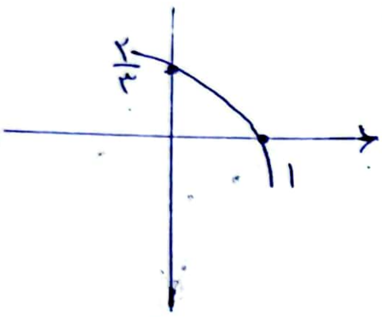
$\rightarrow \Delta = 25 \rightarrow \begin{cases} c_1 = \frac{-3+5}{4} = \frac{1}{2} ✓ \\ c_2 = -2 ✗ \end{cases}$

$\frac{1}{2} + b = -\frac{3}{2} \rightarrow \boxed{b = -2}$

$\rightarrow (a+c)b = (1 + \frac{1}{2}) \times -2 = \frac{3}{2} \times -2 = -3$

(۲

$f(x) = 1 + c \times 3^{a+bx}$, $f(-1) = ?$



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$f(0) = \frac{2}{3} \rightarrow 1 + c \times 3^a = \frac{2}{3} \rightarrow c \times 3^a = -\frac{1}{3}$

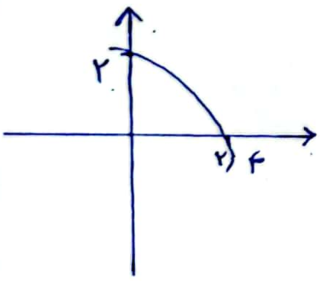
$f(1) = 0 \rightarrow 1 + c \times 3^{a+b} = 0 \rightarrow 1 + c \times 3^a \times 3^b = 1 + (-\frac{1}{3}) \times 3^b = 0$

$3^b = 3 \rightarrow \boxed{b = 1}$

$f(x) = 1 + c \times 3^a \times 3^{bx} = 1 + (-\frac{1}{3}) \times 3^x \rightarrow f(-1) = 1 + (-\frac{1}{3}) \times 3^{-1} = \frac{8}{9}$

(۳

$y = c + \log_5 (ax + b)$, $\frac{a}{b} = ?$



۰/۵

$f(0) = 2 \rightarrow 2 = c + \log_5 b \rightarrow 2 - c = \log_5 b \rightarrow 5^{(2-c)} = b$

$f(2.4) = 0 \rightarrow 0 = c + \log_5 (2.4a + b) \rightarrow -c = \log_5 (2.4a + b) \rightarrow$

$5^{-c} = 2.4a + b \rightarrow (\frac{1}{5})^c = 2.4a + b$

$(\frac{1}{5})^{c-2} = b \rightarrow (\frac{1}{5})^c \times \frac{1}{25} = b \rightarrow (\frac{1}{5})^c = 25b \rightarrow$

$25b = 2.4a + b \rightarrow 24b = 2.4a \rightarrow \frac{a}{b} = \frac{24}{2.4} = 10$

(۴

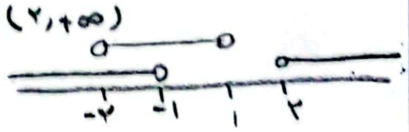
$f(x) = \log_4 (|x^2 - 2| - x) \rightarrow |x^2 - 2| - x > 0 \rightarrow |x^2 - 2| > x \rightarrow \begin{cases} x^2 - 2 > x & (1) \\ x^2 - 2 < -x & (2) \end{cases}$

۲

$\overset{(1)}{\Rightarrow} x^2 - x - 2 > 0 \rightarrow (x-2)(x+1) = 0 \rightarrow$ $+ \underset{-1}{|} - \underset{2}{|} +$ $\rightarrow (-\infty, -1) \cup (2, +\infty)$

$\overset{(2)}{\Rightarrow} x^2 - 2 < -x \rightarrow x^2 + x - 2 < 0 \rightarrow$ $- \underset{-2}{|} + \underset{1}{|} -$ $(-2, 1)$

$(x+2)(x-1) = 0$



$D = (-\infty, 1) \cup (2, +\infty)$

۱۵)

$f(x)=۲+۲^{b-ax}$, $g(x)=-x^{۲}-۳x+۸$, $f^{-1}(۱۰)=-۱$

$۲b-a=?$

$g(۱)=-۱-۳+۸=۴ \rightarrow f(۱)=۴ \rightarrow ۴=۲+۲^{b-a} \rightarrow ۲^{b-a}=۲ \rightarrow b-a=۱$

$f(-۱)=۱۰ \rightarrow ۱۰=۲+۲^{b+a} \rightarrow ۸=۲^{۳}=۲^{b+a} \rightarrow b+a=۳ \rightarrow b=۲, a=۱$

$۲b-a=۲(۲)-۱=۳$

۱۶)

$f(x)=-۲+(\frac{۱}{۲})^{Ax+B}$, $y=x^{۲}-x$ $\quad f(۳)=?$

$x=۱ \rightarrow ۱^{۲}-۱=۰ \rightarrow f(۱)=۰ \rightarrow ۰=-۲+(\frac{۱}{۲})^{A+B}=-۲+۲^{-A-B} \rightarrow ۲^{-A-B}=۲ \rightarrow -A-B=۱$

$x=۲ \rightarrow ۲^{۲}-۲=۲ \rightarrow f(۲)=۲ \rightarrow ۲=-۲+۲^{-۲A-B} \rightarrow ۲^{-۲A-B}=۲^{۲} \rightarrow -۲A-B=۲ \rightarrow$

$A=-۱, B=۰ \rightarrow f(x)=-۲+(\frac{۱}{۲})^{-x} \rightarrow f(۳)=۶$

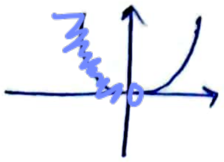
۱۷)

$P=P_0 \times e^{kt} \rightarrow \frac{۱}{۴}\cancel{P_0}=\cancel{P_0}\times(\frac{۱}{۴})^{\frac{۸}{۹}t} \rightarrow \frac{۱}{۴}=(\frac{۱}{۴})^{\frac{۸}{۹}t}$

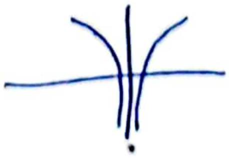
۱۰)

الف) $y=۹^{۱\cdot ۹x}=$ ... $=x^{۲}$

$R=(۰,+\infty)$



ب) $y=۱\cdot ۹^{x^{۲}}$



۱/۷۵

۳) $c+\log_{۵}^{۲,۴a+b} = ۰$ (۱) $\quad c+\log_{۵} b = ۲$ (۲) $\quad$ (۲)−(۱) $= \log_{۵} \frac{b}{۲,۴a+b} = ۲$

$b = ۶۰a + ۲۵b \rightarrow \frac{a}{b} = -۰,۴$

۷)

$(\frac{۸}{۹})^{t} = \frac{۱}{۴} \qquad \log (\frac{۸}{۹})^{t} = \log \frac{۱}{۴} \rightarrow t(\log ۸ - \log ۹) = -(\log^{۳} + \log^{۲})$

$\rightarrow t = \frac{-(\log^{۲} + \log^{۳})}{۳\log^{۲} - ۲\log^{۳}}$ $\quad \left\{ \begin{array}{l} \log_{۲}^{۵} \\ \log_{۳}^{۵} \end{array} \right. \rightarrow \log_{۳}^{۲} = \frac{۷}{۱۲}$

$\div \log^{۳} \rightarrow \quad t = \frac{۱۹}{۳} \qquad \frac{۱۹}{۳} \times ۶۰ = ۳۸۰$

۸) $(\frac{۷}{۸})^{t} = \frac{۱}{۷} \qquad \log_{۳} (\frac{۷}{۸})^{t} = \log_{۳} \frac{۱}{۷} \rightarrow t(\log_{۳}^{۷} - \log_{۳}^{۸}) = -\log_{۳}^{۷}$

$t(\frac{۱۰}{۶} - ۳\times\frac{۵}{۸}) = -\frac{۱۰}{۶} \rightarrow t = ۸ \qquad ۸\times ۷ = ۵۶$

۹) $(۰,۹۶)^{n} = \frac{۱}{۳} \qquad \log (۰,۹۶)^{n} = \log \frac{۱}{۳} \rightarrow n = \frac{-\log^{۳}}{\log^{۹۶} - \log^{۱۰۰}}$

$n = \frac{-\log^{۳}}{\log(۲^{۵}\times ۳) - ۲} = ۲۴$