۱

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

$(a+c)b = ?$

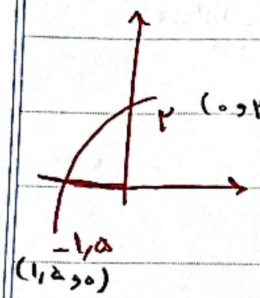
$c - \frac{1}{c} = c^2 - 1 = -\frac{3}{2}c \rightarrow 2c^2 - 2 = -3c$

$2c^2 + 3c - 2 = 0$

$c^2 + 3c - 2 = 0$

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

$\boxed{c = -2}$ ✗ غق $\qquad \boxed{c = \frac{1}{2}}$ ق ✓



$1 - \log_c -b = 2$

$-1 = \log_c -b$

$c^{-1} = -b$

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

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

$b = \frac{-4}{2} = \text{(-2)}$

۶

$0 = 1 - \log_{\frac{1}{2}}^{1,5a+2}$

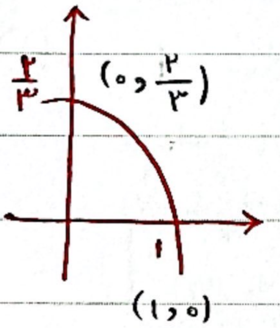
$\log_{\frac{1}{2}}^{-1,5a+2} = 1$

$-1,5a + 2 = \frac{1}{2}$

$-1,5a = \frac{1}{2} - 2 = \frac{1-4}{2} = \frac{-3}{2} \rightarrow a = \frac{-\frac{3}{2}}{\frac{3}{2}} = \text{(+1)}$

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

۲



$f(x) = 1 + C \times 3^{a+bx}$

$\frac{2}{3} = 1 + C \times 3^a$

$-\frac{1}{3} = C \times 3^a$

$-3^{-1} = 3^a \times C$

$\boxed{a = -1}$ $\quad \boxed{C = -1}$

$1 + C \times 3^{a+b} = 0$

$1 - 3^{b-1} = 0$

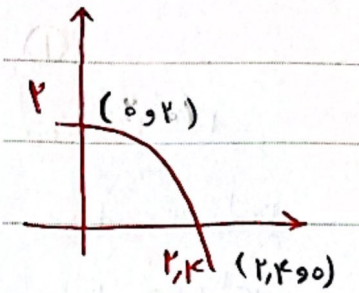
۶

$1 = 3^{b-1}$

$b - 1 = 0 \rightarrow \boxed{b = 1}$

$f(x) = 1 - 3^{-1+x} \rightarrow f(-1) = 1 - 3^{-1-1} = 1 - 3^{-2} = 1 - \frac{1}{9} = \frac{8}{9}$

(۳)



$y = c + \log_a^{(ax+b)}$

$\frac{a}{b} =$

$۲ = c + \log_a^{b}$ $\qquad$ $۰ = c + \log_a^{۲,۲۴a+b}$

$\ominus \begin{cases} c + \log_a^{۲,۲۴a+b} = ۰ \\ c + \log_a^{b} = ۲ \end{cases}$

$\log_a^{۲,۲۴a+b} - \log_a^{b} = -۲$

$\log_a^{\frac{۲,۲۴a+b}{b}} = -۲$

$\frac{۲,۲۴a+b}{b} = \frac{۱}{۲۵}$

$۹۰a + ۲۵b = b$

$۹۰a = -۲۴b \longrightarrow \frac{a}{b} = \frac{\alpha}{\frac{-۹۰}{۲۴}\alpha} = \frac{-۲۴}{۹۰}$

$\frac{-۴}{۱۵} = -۰/۲۶$

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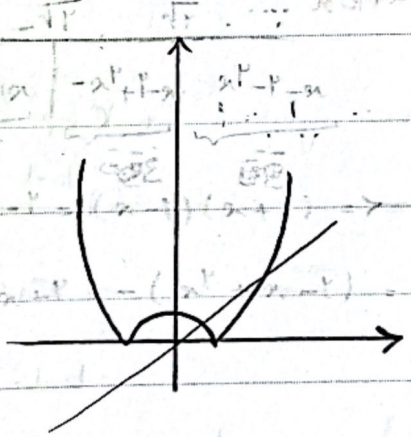
(۴)

$f(x) = \log_۴^{(|x^۲-۲|-۲)}$



$|x^۲-۲| > x$

$|x^۲-۲| = x$

$(x-۲)(x+۱) = ۰$

$x = ۲ \quad x = -۱$

$x^۲ - ۲ + x = ۰$

$(x+۲)(x-۱) = ۰$

$x = -۲ \quad x = ۱$

مرفوض

$D_f = (-\infty, ۱) \cup (۲, +\infty)$

$f(x) = 2 + 2^{b-ax}$ $\quad g(x) = -x^2 - 2x + 8$ (4)

$f(1) = 2 + 2^{b-a} = 4$ $\quad g(1) = -1 - 2 + 8 = 5$

$2^{b-a} = 2$

$\boxed{b-a=1}$

$f(-1) = 10 \rightarrow f(-1) = 2 + 2^{b+a} = 10$ (5)

$2^{b+a} = 8 = 2^3$

$\boxed{b+a=3}$

$\begin{cases} b-a=1 \\ b+a=3 \end{cases}$ $\quad 2b - a = 4 - 1 = 3$

$2b = 4 \rightarrow \boxed{b=2}$ $\quad \boxed{a=1}$

$f(x) = -2 + \left(\frac{1}{2}\right)^{Ax+B}$ $\quad y = x^2 - x$ (4)

$(1,0)$ $\quad (-2, 6)$

$f(1) = -2 + \left(\frac{1}{2}\right)^{A+B} = 0$ $\quad f(2) = -2 + \left(\frac{1}{2}\right)^{2A+B} = 2$ (5)

$\left(\frac{1}{2}\right)^{A+B} = 2$ $\quad \left(\frac{1}{2}\right)^{2A+B} = 4 = 2^{-2}$

$\boxed{A+B=-1}$ $\quad \boxed{-2A-B=2}$

$\begin{cases} A+B=-1 \\ -2A-B=2 \end{cases}$

$-A = 1 \rightarrow \boxed{A=-1}$ $\quad \boxed{B=0}$

$f(2) \Rightarrow -2 + \left(\frac{1}{2}\right)^{-2} \Rightarrow -2 + \left(\frac{1}{2}\right)^{-2} = -2 + 8 = 6$ (4)

Sibo

۷

$$p(t) = p_۰ \times \left(\frac{۸}{۹}\right)^{t}$$

$$p(t)' = \frac{۱}{۴} p_۰ \longrightarrow p_۰ \times \left(\frac{۸}{۹}\right)^{t} = \frac{۱}{۴} \times p_۰$$

$$\left(\frac{۸}{۹}\right)^{t} = \frac{۱}{۴}$$

$$\log_{\frac{۸}{۹}} \frac{۱}{۴} = t$$

$$t = \frac{-\log ۴}{\log ۸ - \log ۹} = \frac{-\frac{۱۰}{۳۴} - \log_{۱۰}^{۳}}{\frac{۳۰}{۳۴} - ۲\log_{۱۰}^{۳}} = \frac{-\frac{۱۰}{۳۴} - \frac{۶۰}{۱۱۹}}{\frac{۳۰}{۳۴} - \frac{۱۲۰}{۱۱۹}} = \frac{\frac{-۳۵ - ۶۰}{۱۱۹}}{\frac{۱۰۵ - ۱۲۰}{۱۱۹}} = \frac{-۹۵}{-۱۵} = \frac{۱۹}{۳} h$$

$$\frac{۱۹}{۳} \times ۶۰ = ۳۸۰$$

۳۸۰ min

$$\log_{۲}^{۱۰} = \log_{۲}^{۵} + \log_{۲}^{۲} = ۲,۴ + ۱ = ۳,۴$$

$$\log_{۱۰}^{۳} = \frac{\log_{۵}^{۳}}{\log_{۵}^{۱۰}} = \frac{\frac{۱۰}{۱۴}}{\frac{۳۴}{۲۴}} = \frac{۲۴۰}{۱۴ \times ۳۴} = \frac{۶۰}{۱۱۹}$$

$$\log_{۵}^{۱۰} = \log_{۵}^{۵} + \log_{۵}^{۲} = ۱ + \frac{۱۰}{۲۴} = \frac{۳۴}{۲۴}$$

۸

$$m(t) = x \times \left(\frac{۷}{۸}\right)^{\frac{t}{۷}} = \frac{۱}{۷} x \longrightarrow \log_{\frac{۷}{۸}} \frac{۱}{۷} = \frac{t}{۷}$$

$$\log_{۲}^{۳} = ۱,۶ \quad , \quad \log_{۷}^{۳} = ۰,۶$$

$$\frac{t}{۷} = \frac{\log_{۳}^{\frac{۱}{۷}}}{\log_{۳}^{\frac{۷}{۸}}} = \frac{\log_{۳}^{۱} - \log_{۳}^{۷}}{\log_{۳}^{۷} - ۳\log_{۳}^{۲}} = \frac{۰ - \frac{۱۰}{۶}}{\frac{۱۰}{۶} - ۳ \times \frac{۱۰}{۱۶}} = \frac{۰ - \frac{۵}{۳}}{\frac{۵}{۳} - \frac{۱۵}{۸}} = ۸$$

$$\boxed{t = ۵۶}$$ روز

$$\log_{۷}^{۳} = \frac{۱}{\log_{۳}^{۷}} = \frac{۶}{۱۰} \longrightarrow \log_{۳}^{۷} = \frac{۱۰}{۶} = \frac{۵}{۳}$$

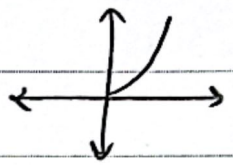
$$\log_{۲}^{۳} = \frac{۱}{\log_{۳}^{۲}} = \frac{۱۶}{۱۰} \longrightarrow \log_{۳}^{۲} = \frac{۱۰}{۱۶} = \frac{۵}{۸}$$

$m(t) = \frac{1}{2}m \times \left(\frac{94}{100}\right)^t = \frac{1}{2}m$ $\quad \log 2 = 0{,}3 \quad \log 3 = 0{,}48$ (۹)

$\log_{\frac{94}{100}} \frac{1}{2} = t = \frac{\log 1 - \log 2}{\log 94 - \log 100} = \frac{-0{,}48}{2\log 3 + \log 2 - 2} = \frac{-0{,}48}{1{,}8 + 0{,}48 - 2} = \frac{-0{,}48}{0{,}28} = \frac{48}{28}$

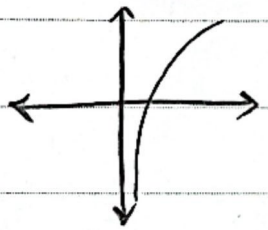
الف) $y = 9^{\log_3 x} = x^{\log_3 9} \cdot x^2$ (۱۰)

$x > 0$

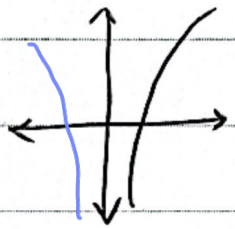


۱٫۷۵

ب) $y = \log_{\frac{1}{2}} x^2 = 2\log x$ $\quad D = \mathbb{R} - \{0\}$



$y = \log_{10} x$



$y = 2\log_{10} x$