فاطمه متقی - ۲۵

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$\begin{vmatrix} 0 \\ 2 \end{vmatrix} \to 1 - \log_c^{-b} = 2 \to -\log_c^{-b} = 1 \to -c^{-1} = b$

$b + c = \frac{-3}{2} \to c - \frac{1}{c} = \frac{-3}{2} \xrightarrow{\times c} c^2 - 1 + \frac{3}{2}c = 0 \xrightarrow{\times 2} 2c^2 + 3c - 2 = 0$

$\hookrightarrow \begin{matrix} c = -2 \times \\ c = \frac{1}{2} \checkmark \end{matrix} \to b = -2 \qquad \Rightarrow (a+c)b = \boxed{-3}$

$\begin{vmatrix} \frac{-3}{2} \\ 0 \end{vmatrix} \to \log_2^{\frac{-3}{2}a + 2} = -1 \to \frac{-3}{2}a + 2 = \frac{1}{2} \to a = 1$

(۲

$\begin{vmatrix} 0 \\ \frac{1}{3} \end{vmatrix} \to 1 + c \times 3^a = \frac{1}{3} \to c \times 3^a = \frac{-1}{3}$

$\begin{vmatrix} 1 \\ 0 \end{vmatrix} \to 1 + c \times 3^{a+b} = 0 \to c \times 3^{a+b} = -1$

$\div \Rightarrow 3^b = 3 \to b = 1$

$f(-1) = 1 + c \times 3^{a-b} \Rightarrow 1 + c \times 3^{a-1} = 1 + c \times 3^a \times \frac{1}{3} = 1 + \left(\frac{-1}{3}\right) \times \frac{1}{3} = \boxed{\frac{8}{9}}$

(۳

$\begin{vmatrix} 0 \\ 2 \end{vmatrix} \to c + \log_5^2 = 2 \to -c = \log_5^b - \log_5^{25}$

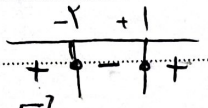
$\begin{vmatrix} 2,4 \\ 0 \end{vmatrix} \to -c = \log_5^{2,4a+b} \Rightarrow \log_5^{2,4a+b} = \log_5^{\frac{b}{25}} \Rightarrow 2,4a + b = \frac{b}{25}$

$\hookrightarrow 25b + 60a = b \to 60a = -24b \to \frac{a}{b} = \frac{-24}{60} = \boxed{\frac{-2}{5}}$

(۴

$|x^2 - 2| - x > 0 \Rightarrow |x^2 - 2| > x \xrightarrow{①\ x > \sqrt{2} \cup x < -\sqrt{2}} x^2 - x - 2 > 0$

$\hookrightarrow x < -1 \cup x > 2 \qquad ② (-\sqrt{2}, \sqrt{2}) \to x^2 + x - 2 < 0$



① اشتراک $\Rightarrow (2, +\infty) \cup (-\infty, -\sqrt{2})$

② اشتراک $\Rightarrow (-\sqrt{2}, 1)$

$\Rightarrow D = (-\infty, 1) \cup (2, +\infty) - \{-\sqrt{2}\}$

(۵

$\begin{vmatrix} x=1 \\ \to \end{vmatrix} -1 - 3 + 8 = 2 + 2^{b-a} \to 2 = 2^{b-a} \Rightarrow b - a = 1$

$\Rightarrow b = 2$

$f^{-1}(10) = -1 \Rightarrow 10 = 2 + 2^{b+a} \to 2^{b+a} = 8 \Rightarrow b + a = 3$

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

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$x=1 \rightarrow 0 = -2 + \left(\frac{1}{2}\right)^{A+B} \rightarrow \left(\frac{1}{2}\right)^{A+B} = 2 \Rightarrow A+B=-1$ (۶

$x=2 \rightarrow 2 = -2 + \left(\frac{1}{2}\right)^{2A+B} \rightarrow 4 = \left(\frac{1}{2}\right)^{2A+B} \Rightarrow 2A+B=-2$ $\rightarrow A=-1$ $B=0$

$f(3) = -2 + \left(\frac{1}{2}\right)^{-3} \rightarrow -2+8 = 6$

$x\left(\frac{8}{9}\right)^h = \frac{1}{6}x \Rightarrow \left(\frac{8}{9}\right)^h = \frac{1}{6} \Rightarrow \log_{\frac{8}{9}}^{\frac{1}{6}} = h \Rightarrow \log_{\frac{9}{8}}^{6} = h$ (۷

$h = \frac{\log_5^6}{\log_5^9 - \log_5^8} = \frac{\log_5^2 + \log_5^3}{2\log_5^3 - 3\log_5^2} \Rightarrow \frac{\frac{1}{\log_2^5} + \frac{1}{\log_3^5}}{\frac{2}{\log_3^5} - \frac{3}{\log_2^5}} = \frac{\log_3^5 + \log_2^5}{\log_2^5 \times \log_3^5} \Big/ \frac{2\log_2^5 - 3\log_3^5}{\log_2^5 \times \log_3^5}$

$\hookrightarrow \frac{24+14}{2(24)-3(14)} = \frac{3.8}{0.4}h \Rightarrow 380\ min$

$x\left(\frac{875}{100}\right)^a = \frac{1}{7}x \Rightarrow \left(\frac{3.5}{4}\right)^a = \frac{1}{7} \Rightarrow \log_{\frac{3.5}{4}}^{\frac{1}{7}} = a \Rightarrow \log_{\frac{4}{3.5}}^{7} = a$ (۸

$\hookrightarrow \frac{1}{a} = \log_7^4 - \log_7^{3.5} = 2\log_7^2 - \log_7^7 + \log_7^2 = 3\log_7^2 - 1$

$\frac{\frac{1}{a}+1}{3} = \frac{\log_3^2}{\log_3^7} = \frac{\log_2^3}{\log_2^7} = \frac{0.4}{1.4} = \frac{3}{8} \Rightarrow 9 = \frac{8}{a} + 8 \Rightarrow \frac{8}{a} = 1$

$a=8$ یعنی $\Rightarrow 8\times 7 =$ روز ۵۶

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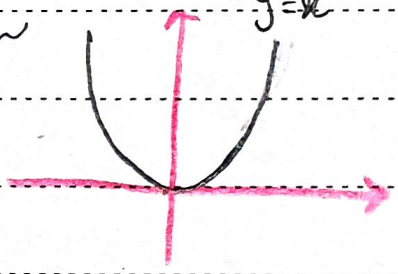
۴) $P' = P\left(\frac{۹۶}{۱۰۰}\right)^a \Rightarrow P' = ۱۰۰ \times \left(\frac{۹۶}{۱۰۰}\right)^a$

$\hookrightarrow \frac{۱۰۰}{۳} = ۱۰۰ \times \left(\frac{۲۴}{۲۵}\right)^a \Rightarrow \left(\frac{۲۴}{۲۵}\right)^a = \frac{۱}{۳} \Rightarrow \log_{\frac{۲۴}{۲۵}}^{\frac{۱}{۳}} = a$

$\hookrightarrow a = \log_{\frac{۲۵}{۲۴}}^{۳} = \frac{\log ۳}{۲\log ۵ - \log ۲۴} = \frac{\log ۳}{۲(\log ۱۰ - \log ۲) - (۳\log ۲ + \log ۳)}$

$\frac{\log ۳}{۲ - \log ۳ - ۵\log ۲}$ جایگذاری $\frac{۰/۴۸}{۲ - ۰/۴۸ - ۱/۵} = \frac{۰/۴۸}{۰/۰۲} = ۲۴$ روز

۱۰) الف) $y = ۹^{\log_۳^x} \rightarrow x^{\log_۳^۹} = x^۲$ → سهمی



ب) $y = \log x^۲ \rightarrow ۲\log x$