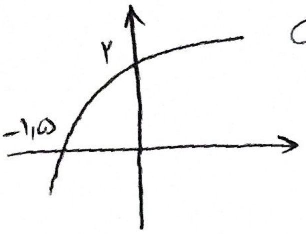
نام و نام خانوادگی ...مهدی ابوفاضلی... پاسخنامه تشریحی تکلیف شماره ...۲۵... کلاس ...یازدهم ریاضی A...

۱۹٫۵

۱ (۱٫۷۵)



$y = 1 - \log_c^{(ax-b)} \longrightarrow \begin{cases} f(0)=2 \\ 1-\log_c^{-b} = 2 \longrightarrow \log_c^{-b} = -1 \longrightarrow \frac{1}{c} = -b \end{cases} \Longrightarrow \boxed{-bc=1}$

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

$(a+c)b = ? \longrightarrow \begin{cases} f(-1.5)=0 \\ 1-\log_c^{-1.5a-b} = 0 \longrightarrow \log_c^{-(1.5a+b)} = 1 \end{cases}$

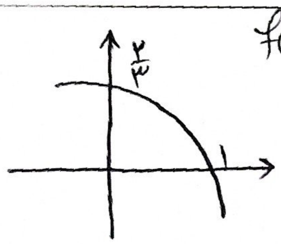
$-1.5a - b = c$

$-1.5a = b+c = -\frac{3}{2} \longrightarrow \boxed{a=1}$ ✓ $\begin{cases} b+c = -\frac{3}{2} \\ bc = -1 \end{cases}$ $b=-2$ ✓ $c = \frac{1}{2}$ ✓ $\longrightarrow (a+c)b$, $(1+\frac{1}{2})(-2) = \cancel{2}$

$\boxed{-3}$

دقت!

۲ (۲)



$f(x) = 1 + c \times 3^{a+bx} \longrightarrow \begin{cases} f(1)=0 \longrightarrow 1+3^{a+b} \times c = 0 \\ f(0) = \frac{2}{3} \longrightarrow 1 + c \cdot 3^a = \frac{2}{3} \end{cases}$

$f(-1) = ?$

$\Longrightarrow \begin{cases} c \times 3^a \times 3^b = -1 \\ c \cdot 3^a = -\frac{1}{3} \end{cases} \xrightarrow{\text{تقسیم}} 3^b = 3 \longrightarrow \boxed{b=1}$ ✓

$f(-1) = 1 + \underbrace{c \times 3^a}_{-\frac{1}{3}} \times 3^{bx} \xrightarrow[x=-1]{b=1} 1 + (-\frac{1}{3}) \cdot (\frac{1}{3}) = 1 - \frac{1}{9} = \frac{8}{9}$ ✓

۳ (۲)

$y = c + \log_5^{(ax+b)} \longrightarrow \begin{cases} 2 = c + \log_5^b \\ 0 = c + \log_5^{(2.4a+b)} \end{cases} \longrightarrow \log_5^{(2.4a+b)} - \log_5^b = -2$

$\frac{a}{b} = ?$ $\log_5 \frac{2.4a+b}{b} = -2 \longrightarrow \frac{2.4a+b}{b} = 5^{-2} \longrightarrow \frac{2.4a+b}{b} = \frac{1}{25}$ $2.4\frac{a}{b} + 1 = \frac{1}{25}$

$\frac{a}{b} = \frac{+\cancel{1-25}^{\,-24}}{25} \times \frac{10}{24} = -\frac{10}{25} = \frac{-2}{5}$ ✓

۴ (۲)

$f(x) = \log_4^{(|x^2-2|-x)} \longrightarrow |x^2-2| - x > 0$, $+$ قدرمطلق $\longrightarrow x^2 - x - 2 > 0$ $\quad$ $-1, 2$: $+ \mid - \mid +$ (I)

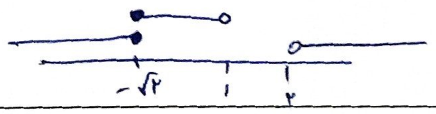
$-$ قدرمطلق $\longrightarrow -x^2 - x + 2 > 0$ $\quad$ $-2, 1$: $- \mid + \mid -$ (II)

$\log_b^a \longrightarrow \begin{cases} a>0 \\ b>0 \\ b \neq 1 \end{cases}$

$+$ قدرمطلق $\longrightarrow x^2 > 2 \xrightarrow{\text{I}'} \begin{cases} x > \sqrt{2} \\ x < -\sqrt{2} \end{cases}$ $\quad \text{I} \cap \text{I}' \longrightarrow (-\infty, -\sqrt{2}) \cup (2, +\infty)$

$-$ قدرمطلق $\longrightarrow x^2 < 2$ (II$'$) $\longrightarrow -\sqrt{2} < x < \sqrt{2}$ $\quad \text{II} \cap \text{II}' \longrightarrow (-\sqrt{2}, 1)$

$\xRightarrow{\cup}$



$\Longrightarrow D_f = (-\infty, 1) \cup (2, +\infty)$ ✓

۵ (۲)

$f(x) = 2 + 2^{b-ax} \xrightarrow{\text{تقاطع}} x=1 \longrightarrow f(1) = g(1) \Longrightarrow 2 + 2^{b-a} = -1-3+8 \Longrightarrow 2+2^{b-a} = 4$

$g(x) = -x^2 - 3x + 8$

$\Longrightarrow 2^{b-a} = 2 \longrightarrow \boxed{b-a=1}$

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

$2b - a = ?$

دستگاه $\longrightarrow \begin{cases} b+a = 3 \\ b-a = 1 \end{cases} \xrightarrow{+} 2b = 4 \longrightarrow \begin{cases} b=2 \\ a=1 \end{cases}$ ✓ $\longrightarrow 2b-a = 4-1 = 3$ ✓

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

$y = x^2 - x$

$f(3) = ?$

$\xrightarrow{\quad}$ تقاطع $\begin{cases} x_1 = 1 \\ x_2 = 2 \end{cases} \xrightarrow{x^2-x} \begin{cases} y_1 = 0 \\ y_2 = 2 \end{cases}$

$\begin{cases} f(1)=0 \longrightarrow -2+\left(\frac{1}{2}\right)^{A+B}=0 \longrightarrow 2^{-A-B}=2 \\ f(2)=2 \longrightarrow -2+\left(\frac{1}{2}\right)^{2A+B}=2 \longrightarrow 2^{-2A-B}=4 \end{cases} \longrightarrow \begin{cases} -A-B=1 \\ -2A-B=2 \end{cases}$ (2) 6

$\Longrightarrow -A=1 \longrightarrow \begin{cases} A=-1 \\ B=0 \end{cases} \longrightarrow f(3) = -2+\left(\frac{1}{2}\right)^{-x} = -2+\left(\frac{1}{2}\right)^{-3} \longrightarrow 8-2 = 6$ ✓

$\xrightarrow[-\frac{1}{9}]{1h} \frac{8}{9} \xrightarrow[-\frac{1}{9}]{1h} \frac{8}{9}\times\frac{8}{9} \xrightarrow{1h} \left(\frac{8}{9}\right)^3 \longrightarrow \cdots\cdots \longrightarrow \frac{1}{4}$ (1/75)

هر ساعت ضربدر $\frac{8}{9}$ می‌شود

$\log_{2}^{5} \simeq 2.4$ $\quad B(t) = B_0\left(\frac{8}{9}\right)^t \longrightarrow \frac{B_0}{4} = B_0\left(\frac{8}{9}\right)^t \longrightarrow \left(\frac{8}{9}\right)^t = \frac{1}{4}$ 7

$\log_{3}^{5} \simeq 1.4 \Longrightarrow \log_{5}^{\left(\frac{8}{9}\right)^t} = \log_{5}^{\frac{1}{4}} \longrightarrow t\log_{5}^{\left(\frac{8}{9}\right)} = -\log_{5}^{4} \longrightarrow \log_{b}^{a} = \frac{\log_{c}^{a}}{\log_{c}^{b}}$

$\Longrightarrow \frac{-\log_{5}^{4}}{\log_{5}^{8/9}} = \frac{-\log_{5}^{4}}{\log_{5}^{8}-\log_{5}^{9}} = \frac{-\left(\frac{5}{12}+\frac{5}{7}\right)}{\left(-\frac{10}{7}+\frac{5}{4}\right)} \xrightarrow{\text{ساعت}} \frac{19}{3} = 6.3$ ✓ $\times 60 = \boxed{380\,min}$

$12.5\% = \frac{1}{8}$ $\longrightarrow B(t) = B_0\left(\frac{7}{8}\right)^{t/7} \longrightarrow \frac{1}{7}B_0 = B_0\left(\frac{7}{8}\right)^{t/7} \longrightarrow \left(\frac{7}{8}\right)^{t/7} = \frac{1}{7}$

$\xrightarrow{\text{۱ هفته}} \frac{7}{8} \xrightarrow{\text{۱ هفته}} \frac{7}{8}\times\frac{7}{8} \longrightarrow \cdots\cdots \longrightarrow \frac{1}{7}$ (2)

$\log_{7}^{3} \simeq 0.6$ $\quad \log_{3}^{\left(\frac{7}{8}\right)^{t/7}} = \log_{3}^{\left(\frac{1}{7}\right)} \longrightarrow \frac{t}{7}\log_{3}^{\left(\frac{7}{8}\right)} = \log_{3}^{\left(\frac{1}{7}\right)} \longrightarrow \frac{t}{7}\left(\log_{3}^{7}-\log_{3}^{8}\right) = -\log_{3}^{7}$ 8

$\log_{2}^{3} \simeq 1.6$ $\quad \log_{3}^{7} = \frac{5}{3} \longrightarrow \frac{t}{7}\left(\log_{3}^{7}-3\log_{3}^{2}\right) = -\log_{3}^{7} \longrightarrow \frac{t}{7}\left(\frac{5}{3}-3\times\frac{5}{8}\right) = -\frac{5}{3}$

$\log_{3}^{2} = \frac{5}{8}$

$\Longrightarrow \frac{t}{7}\left(\frac{40-45}{24}\right) = -\frac{5}{3} \longrightarrow \frac{t}{7}\left(-\frac{5}{24}\right) = -\frac{5}{3} \Longrightarrow \frac{t}{56} = 1 \longrightarrow t = 56$ ✓

$100\,lit$ $\qquad$ * غلظت محلول هر روز $\frac{94}{100}$ می‌شود .

$100\,lit \longrightarrow 94\,lit + 4 \longrightarrow 92\,lit + 8 \longrightarrow \cdots\cdots \longrightarrow$ (2)

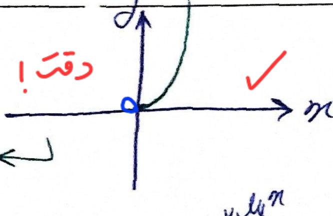
غلظت اولیه $\longrightarrow x$

$\log 2 \simeq 0.3$ $\quad f(t) = x\cdot\left(\frac{94}{100}\right)^t \longrightarrow \frac{x}{3} = x\left(\frac{94}{100}\right)^t \longrightarrow \left(\frac{94}{100}\right)^t = \frac{1}{3}$ 9

$\log 3 \simeq 0.48 \Longrightarrow \log\left(\frac{94}{100}\right)^t = \log\frac{1}{3} = t(\log 94 - \log 100) = -\log 3 \longrightarrow t\left(\log 2^5 + \log 3 - 2\right) = -\log 3$

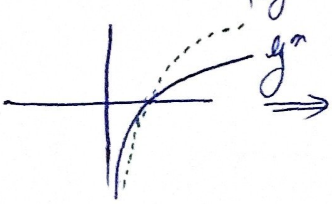
$\Longrightarrow t\left(5(0.3)+0.48-2\right) = -0.48 \longrightarrow t(1.5+0.48-2) = -0.48 \longrightarrow -0.02t = -0.48$ $\quad t = 24$ ✓

الف) $y = 9^{\log_{3}^{x}} \longrightarrow x^{\log_{3}^{9}} \longrightarrow x^2$ $\quad$ دقت ! ✓ (2)

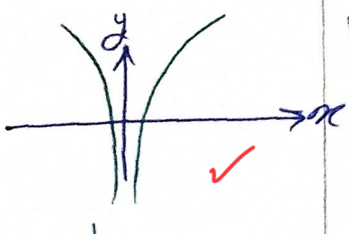


x های منفی در دامنه‌ی تابع نیست !

ب) $y = \log x^2 = 2\log x \longrightarrow \log x :$ 10



$\Longrightarrow 2\log x :$



✓

$x^2 > 0 \longrightarrow \mathbb{R} \longrightarrow$ دامنه‌ی این تابع منفی نیز می‌تواند باشد .