۱۳

نام و نام خانوادگی: مهیار رجبی زاده — پاسخنامه تشریحی تکلیف شماره ۲۵ — کلاس یازدهم

۱ (۲)

$y = \log_c^{(ax-b)}$, $x=0 \Rightarrow y=1 \Rightarrow 2 = 1 - \log_c^{(-b)} \Rightarrow \log_c^{-b} = -1 \Rightarrow \frac{1}{c} = -b$

$-\frac{1}{c} + c = -\frac{3}{2} \Rightarrow 2c^2 + 3c - 2 = 0 \Rightarrow c = -2$ (غ ق ق) , $c = \frac{1}{2}$ ✓ $\Rightarrow b = -2$ ✓

$y=0 \Rightarrow 1 - \log_{\frac{1}{2}}^{ax+2} = 0 \Rightarrow ax+2 = \frac{1}{2} \Rightarrow ax = -\frac{3}{2} = -\frac{3}{2} \Rightarrow a = 1$ ✓ $(\frac{3x-2}{...}) = -3$ ✓

۲ (۱.۷۵)

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

$\frac{c\times 3^{a+b}}{c\times 3^{a}} = \frac{-1}{-\frac{1}{3}} = 3^{b} = 3 \Rightarrow b = 1 \Rightarrow f(-1) = 1 + c\times 3^{(a-1)}$ — اولویت با ضربه — $= 1 + c \times 3^{a} \times \frac{1}{3}$, $3^{a} \times \frac{1}{3} = \frac{2}{9}$

$1 + (-\frac{1}{3} \times \frac{1}{3}) = \frac{8}{9}$

۳ (۲)

$x=0 \Rightarrow 2 = c + \log_5^{b}$, $0 = c + \log_5^{2.4a+b} \Rightarrow c = -\log_5^{2.4a+b} \Rightarrow 2 = -\log_5^{2.4a+b} + \log_5^{b}$

$\log_5^{\frac{b}{2.4a+b}} = 2 \Rightarrow \frac{b}{2.4a+b} = 25 \Rightarrow b = 25b + 25(2.4a) \Rightarrow -24b = 25(2.4a)$

$\frac{b}{a} = -2.5 \Rightarrow \frac{a}{b} = -\frac{10}{25}$ ✓

۴ (۱.۷۵)

$|x^2-2| - x > 0 \Rightarrow |x^2-2| > x \Rightarrow x^2-2 > x$ یا $x^2-2 < -x$

$x^2 - x - 2 > 0 \Rightarrow x > 2 \cup x < -1$ ✓ , $(x-2)(x+1)$; $x^2 + x - 2 < 0$, $(x+2)(x-1)$, $1 > x > -2$ ✓

جدول تعیین علامت: -1 ، 2 : $+ \; - \; +$ ؛ -2 ، 1 : $+ \; - \; +$

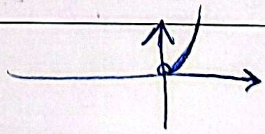
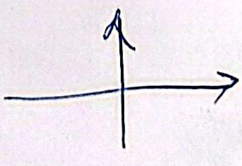
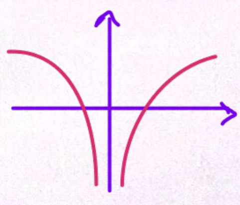
$(-\infty, 1) \cup (2, +\infty)$

۵ (۲)

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

$f^{-1}(10) = -1 \Rightarrow f(-1) = 10 = 2 + 2^{b+a} \Rightarrow 2^{b+a} = 2^3 \Rightarrow b + a = 3$; $b = 2$, $a = 1$ ✓

$2b - a = (2\times 2) - 1 = 3$ ✓

$x=1 \Rightarrow y=x^{۲}-x=f(x) \Rightarrow f(1)=-۲+\left(\frac{1}{۲}\right)^{A+B}=0 \Rightarrow \left(\frac{1}{۲}\right)^{A+B}=۲ \Rightarrow A+B=-1$ $x=۲ \Rightarrow x^{۲}-x=۲=f(۲)=-۲+\left(\frac{1}{۲}\right)^{۲A+B} \Rightarrow \left(\frac{1}{۲}\right)^{۲A+B}=۴ \Rightarrow ۲A+B=-۲$ $A=-1$, $B=0$ $f(۳)=-۲+\left(\frac{1}{۲}\right)^{۳A}=-۲+\left(\frac{1}{۲}\right)^{-۳}=۶$ ✓ شش	۶	۲
x ... $\xrightarrow{1h} \frac{۸}{۹}x$ ... $\xrightarrow{1h} \frac{۶۴}{۸۱}x$ ... $\left(\frac{1}{۹}\right)^{t}=$	۷	۰
$\frac{۲}{1}$ ... $\frac{1}{۸} \rightarrow \left(\frac{1}{۸}\right)^{t}=\frac{۴}{۷} \longrightarrow$	۸	۰
$\frac{۱۲}{100}$ ... $\frac{۸}{}$ ... $(\frac{A}{۷})^{t}$	۹	۰
الف) $y=۹^{\log_{۳}^{x}} \Rightarrow x^{\log_{۳}^{۹}} \rightarrow y=x^{۲} \rightarrow$  ✓ ب) $y=\log x^{۲}$   $D_f=\mathbb{R}-\{0\}$ ✓	۱۰	۱,۵

۷-

جرم باقی‌مانده $= \frac{m_0}{4} = m_0\left(\frac{8}{9}\right)^t \rightarrow \left(\frac{8}{9}\right)^t = \frac{1}{4}$

$\xrightarrow{\log} t\log\frac{8}{9} = \log\frac{1}{4} \rightarrow t(3\log 2 - 2\log 3) = -(\log 3 + \log 2)$

$t = \frac{-(\log 2 + \log 3)}{3\log 2 - 2\log 3} \xrightarrow{\div \log 3} t = \frac{-(\log_3^2 + 1)}{3\log_3^2 - 2} = \frac{-(\frac{7}{12}+1)}{3(\frac{7}{12})-2} = \boxed{\frac{19}{3}}$

$\frac{\log_3^5}{\log_2^5} = \frac{\log 2}{\log 3} = \frac{1,4}{2,4} = \frac{7}{12}$

به ساعت $= 60 \times 38 \text{ min}$

۸-

جرم باقی‌مانده $= \frac{m_0}{7} = \left(\frac{7}{8}\right)^t m_0 \rightarrow \left(\frac{7}{8}\right)^t = \frac{1}{7}$

$\xrightarrow{\log_3} t\log_3^{\frac{7}{8}} = -\log_3^7 \rightarrow t(\log_3^7 - 3\log_3^2) = -\log_3^7$

$t\left(\frac{10}{4} - 3\times\frac{5}{n}\right) = -\frac{10}{4} \rightarrow t = 8 \text{ هفته} \times 7 = 56 \text{ روز}$

۹-

$(0,94)^n A_0 = \frac{1}{3} A_0 \rightarrow (0,94)^n = \frac{1}{3}$

$\xrightarrow{\log} n\log 0,94 = -\log 3 \rightarrow n = \frac{-\log 3}{\log 94 - 2}$

$n = \frac{\log 3}{2 - \log(2^5 \times 3)} = \frac{\log 3}{2 - (5\log 2 + \log 3)} = \frac{0,48}{2 - (5(0,3) + 0,48)}$

$= \boxed{24}$