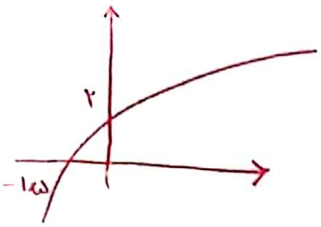
پاسخ سوالات هفتم کلاس دهم ریاضی تکلیف ۲۵

سوال ۱) ۲۰



$y = 1 - \log_c^{(ax-b)}$

$b = \frac{-1}{2}$ I

$(\frac{-1}{0}\omega) \rightsquigarrow y = 1 - \log_c^{-1/\omega a - b} = 0 \rightarrow -1/\omega a - b = 1$

$(\frac{0}{2}) \rightsquigarrow 1 - \log_c^{-b} = 2 \rightarrow c^{-1} = -b \Rightarrow \frac{1}{c} = -b$ II

I, II $\rightarrow -c + \frac{1}{c} + \frac{3}{2} = 0 \quad -c^2 + \frac{3}{2}c + 1 = 0 \quad -2c^2 + 3c + 2 = 0 \quad c^2 + 3c - 4 = 0$

$(c+4)(c-1) = 0$

$\begin{cases} c = \frac{-4}{-2} = 2 \rightarrow -b = -\frac{1}{2} & \times \\ c = \frac{1}{-2} = \frac{-1}{2} \rightarrow -b = 2 & \checkmark \end{cases}$

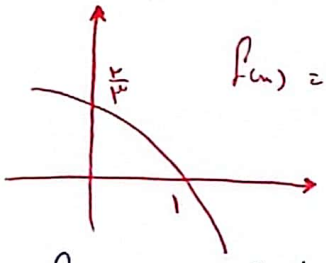
$b = -2$ ✓ $\quad -b > 0$

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

$1 - \log_{\frac{1}{2}}^{-1/\omega a + 2} = 0 \quad \log_{\frac{1}{2}}^{-1/\omega a + 2} = 1 \quad -1/\omega a + 2 = 0/\omega$

$1/\omega a = 1/\omega \rightarrow a = 1$ ✓ $\quad -2(1/\omega) = -3$ ✓

سوال ۲)



$f(x) = 1 + c \times 3^{ax+b}$

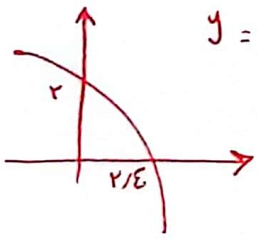
$(\frac{0}{\frac{2}{3}}) \rightsquigarrow 1 + c \times 3^{a} = \frac{2}{3} \Rightarrow c \times 3^{a} = -1 \times 3^{-1}$

$(\frac{1}{0}) \rightsquigarrow 1 + 3^{b-1} = 0 \Rightarrow 3^{b-1} = 3^{0} \rightarrow b = 1$

$\xrightarrow{\text{جدا تساوی جمع}} \begin{cases} c = -1 \\ a = -1 \end{cases}$

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

سوال ۳)



$y = c + \log_{\omega}^{(ax+b)} \quad \frac{a}{b} = ?$

$c + \log_{\omega}^{b} = 2 \quad \omega^{2-c} = b$

$c + \log_{\omega}^{2/4a+b} = 0 \quad \omega^{-c} = 2/4a + b$

$\rightarrow 24 \times \omega^{-c} = -2/4a$

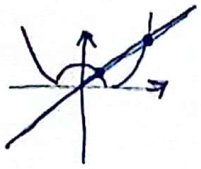
$24 \times \omega^{-c} = 24(\frac{-a}{10})$

$\log_{\omega}^{-24+b} = 0 \quad -24 + b = 1 \quad b = 25$

$\frac{a}{b} = \frac{-10}{25} = \frac{-2}{5}$ ✓

$\xrightarrow{\text{حذ}} \begin{cases} c = 0 \\ a = -10 \end{cases}$

سوال ۴)



$f(x) = \log_{3}^{(|x^2-2|-x)}$

$|x^2-2| - x > 0$

$|x^2-2| > x$

$x^2 - 2 - x > 0 \rightarrow (x-2)(x+1) = 0 \quad x = 2$ ✓ $\longrightarrow$ I صلق نمودار $\quad x > 2$

$-x^2 + 2 > x \quad x^2 + x - 2 < 0 \rightarrow (x+2)(x-1) = 0$ (-2, 1) $\rightarrow$ II صلق نمودار $\quad x < 1$

I, II $\rightarrow x > 2$, $x < 1 \quad (-\infty, 1) \cup (2, +\infty)$ ✓

سوال ۵)

$f(x) = 2 + 2^{b-ax}$

$g(x) = x^2 - 2x + 1$ ← طول نقطه تقاطع ۱

$f^{-1}(10) = -1 \rightarrow f(-1) = 10$ (۲)

$2b - a = ?$

$g(1) = -(1)^2 - 2(1) + 1 = 4$ $\quad 2 + 2^{b-a} = 4$ $\quad 2^{b-a} = 2^1$ $\begin{cases} b = a+1 \\ b+a = 2 \end{cases}$

$2 + 2^{b+a} = 10 \rightarrow 2^{b+a} = 2^3 \longrightarrow$ $2a = 2$, $a = 1$, $b = 2$ ✓

$2b - a = 2(2) - 1 = \boxed{3}$ ✓

سوال ۶)

$f(x) = -2 + \left(\frac{1}{2}\right)^{Ax+B}$ $\quad$ طول نقاط تقاطع ۱ و ۲ $\quad$ $f(3) = ?$

$y = x^2 - x$ (۲)

$y = (1)^2 - 1 = 0 \rightarrow -2 + 2^{-A-B} = 0 \quad 2^{-A-B} = 2^1 \longrightarrow -A - B = 1$

$y = (2)^2 - 2 = 2 \rightarrow -2 + 2^{-2A-B} = 2 \quad 2^{-2A-B} = 2^2 \longrightarrow -2A - B = 2$ $\Big\} \rightarrow -A = 1 \rightarrow A = -1$, $B = 0$

$f(x) = -2 + 2^x = -2 + 2^3 = 6$ ✓

سوال ۷)

$M = M_0 \left(\frac{1}{9}\right)^t$ ← جرم باقی‌مانده ← جرم اولیه

$\frac{1}{6} = \left(\frac{5}{9}\right)^t$ $\quad \log_{10} 6^{-1} = t \log_{10} \frac{8}{9}$ (۲)

$\log_2 \omega \simeq 2.4 \Rightarrow \frac{\log \omega}{\log 2} = 2.4$ $\quad \log 2 \simeq \frac{\log \omega}{2.4}$

$\log_3 \omega \simeq 1.4 \Rightarrow \frac{\log \omega}{\log 3} = 1.4$ $\quad \log 3 \simeq \frac{\log \omega}{1.4}$

$-(\log 2 + \log 3) = t(3\log 2 - 2\log 3) \Rightarrow -\left(\frac{\log \omega}{2.4} + \frac{\log \omega}{1.4}\right) = t\left(\frac{3\log \omega}{2.4} - \frac{2\log \omega}{1.4}\right)$

$-\frac{3.8}{2.4 \times 1.4} = t\left(\frac{4.2 - 4.8}{2.4 \times 1.4}\right) \Rightarrow t = \frac{3.8}{0.6} \times 60 = 380$ دقیقه ✓

سوال ۸)

$M = M_0 \left(\frac{7}{8}\right)^t$ ← جرم باقی‌مانده ← جرم اولیه $\quad t \rightarrow$ هفته

$\left(\frac{1}{7}\right) = \left(\frac{7}{8}\right)^t$ $\quad \log 7^{-1} = t \log \frac{7}{8}$ (۲)

$-\log 7 = t(\log 7 - 3\log 2)$

$\log_2 3 = \frac{\log 3}{\log 2} = 1.6 \rightarrow \log 2 \simeq \frac{\log 3}{1.6}$

$-\frac{\log 3}{0.6} = t\left(\frac{\log 3}{0.6} - \frac{3\log 3}{1.6}\right)$

$\log_7 3 = \frac{\log 3}{\log 7} = 0.6 \rightarrow \log 7 = \frac{\log 3}{0.6}$

$\frac{-1.6}{9.6} = t\left(\frac{1.6 - 1.8}{9.6}\right) \Rightarrow t = 8$

$8 \times 8 = 64$ روز ✓

سوال ۹)

روز اول: ۱۰۰٪ — روز دوم: ۱۰۰ − ۴ = ۹۶٪ — روز سوم: $96 - \frac{96}{100} \times 4 = 96(1 - \frac{4}{100})$ (۲)

$100, 100(1-\frac{4}{100}), 100(1-\frac{4}{100})^2, \ldots \longrightarrow$ روز $n+1$ ام: $100(1-\frac{4}{100})^n$ → بیت از دست رفته در روز n

$$100(1-\frac{4}{100})^n = \frac{1}{2} \times 100 \Rightarrow (\frac{24}{25})^n = \frac{1}{2}$$

$$n = \log_{\frac{24}{25}} \frac{1}{2} = \frac{-\log 2}{\log 24 - \log 25} = \frac{-\log 2}{\log 3 + 3\log 2 - 2\log 5}$$

$$= \frac{-\log 2}{\log 3 + 3\log 2 - 2(1-\log 2)} = \frac{-\log 2}{\log 3 + 5\log 2 - 2} = \frac{-0.3}{0.48 + 0.7 - 2} = \frac{-0.3}{-0.82} = 24$$ ✓

سوال ۱۰) (۲)

الف) $y = 9^{\log_3 x} \longrightarrow x^{\log_3 9} = x^2$

$x > 0$

ب) $y = \log x^2 = \begin{cases} 2\log x & x > 0 \\ 2\log -x & x < 0 \end{cases}$