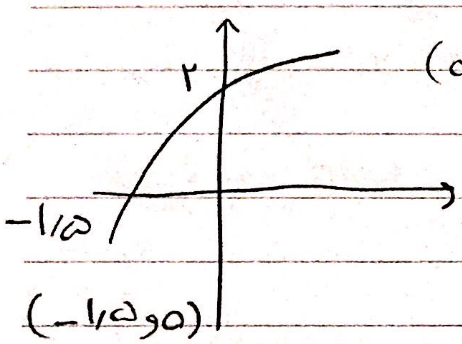
۱۸,۷۵

یازدهم ذهنه A — سارینا رشید محمدی — تکلیف شماره ۲۵

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

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

۶



$(0,2) \Rightarrow 2=1-\log_c^{-b}$

$\Rightarrow \log_c^{-b}=-1 \Rightarrow -b=\frac{1}{c}$

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

$\Rightarrow \frac{c^2-1}{c}=\frac{-3}{2} \Rightarrow 2c^2-2=-3c$ $\quad \times -2$

$\Rightarrow c^2+3c-4=0 \Rightarrow (c+4)(c-1)=0 \Rightarrow c=\frac{-4}{2}$ ، $c=\frac{1}{2}$ ✓

$c=\frac{1}{2} \Leftarrow c>0$

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

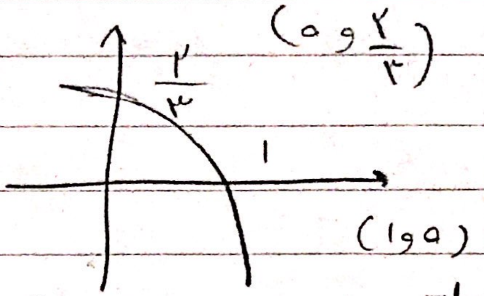
$1-\log_{2^{-1}}^{-1.5a+2}=0$

$\Rightarrow 2^{-1}=-1.5a+2 \Rightarrow \frac{1}{2}=-\frac{3}{2}a+\frac{4}{2}$

$\Rightarrow \frac{1}{\cancel{2}}=\frac{4-3a}{\cancel{2}} \Rightarrow a=1$

۲- $f(x)=1+c\times 3^{a+bx}$

$f(-1)=?$



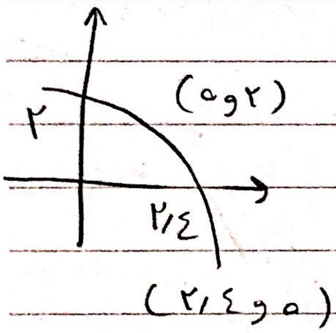
$1+3^{a}c=\frac{2}{3} \Rightarrow 3^{a}\times c=-\frac{1}{3} \Rightarrow -3^{-1}=3^{a}\times c$

$\Rightarrow a=-1$ و $c=-1$

$1+-3^{b-1}=0 \Rightarrow 1=3^{b-1} \Rightarrow b-1=0 \Rightarrow b=1$

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

۳- $y=c+\log_{5}(ax+b)$



$c+\log_{5} b=2$

$c+\log_{5}(2.4a+b)=0$

از هم کم می‌کنیم $\Rightarrow \log_{5} b-\log_{5}(2.4a+b)=2$

$\Rightarrow \log_{5}\frac{b}{2.4a+b}=2 \Rightarrow 25=\frac{b}{2.4a+b}$

$\Rightarrow b=60a+25b \Rightarrow 60a=-24b$

$\Rightarrow \frac{a}{b}=\frac{\frac{-24\cancel{b}}{60}}{\frac{\cancel{b}}{1}}=\frac{-24}{60}=\frac{-6}{15}=\frac{-2}{5}$

۴- $f(x) = \log_4 (|x^2-2|-x)$

$D_f = ?$ $\qquad |x^2-2|-x > 0$

$-\sqrt{2} \qquad \sqrt{2}$

$\underbrace{x^2-2-x}_{x^2-x-2} \quad | \underbrace{\cancel{2-x^2}-x}_{-x^2-x+2} | \quad \underbrace{x^2-2-x}_{x^2-x-2}$

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

$x^2-x-2 = (x-2)(x+1) \Rightarrow$ $-1 \quad 2$: $+ \,|\, - \,|\, +$ $=$ (۱)

$-x^2-x+2 = -(x-2)(x+1) \Rightarrow$ $-2 \quad 1$: $- \,|\, + \,|\, -$ $\hookrightarrow (-2,1)$

$D_f = (-\infty,-1)\cup(2,+\infty) \Leftarrow$ قرار ندارد $(\cancel{-\sqrt{2}},\sqrt{2})$ در بازه $\Leftarrow$ غ ق ق

۵- $f(x) = 2+2^{b-ax}$ $\qquad f^{-1}(10) = -1$

$g(x) = -x^2-3x+8$ $\qquad x=1 \Rightarrow 2+2^{b-a} = 4$

$2b-a = ?$

$\Rightarrow 2^{b-a} = 2 \Rightarrow b-a=1$

و $2+2^{b+a} = 10 \Rightarrow b+a=3$

$b-a=1$, $b+a=3 \Rightarrow 2b=4 \Rightarrow b=2$

و $a=1 \Rightarrow 4-1=3=2b-a$

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

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

$\Rightarrow 2^{-(A+B)} = 2 \Rightarrow A+B=-1$

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

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

$2^{-(2A+B)} = 4$

$\Rightarrow -2A-B = 2$

$A+B=-1$

$-2A-B=2$

$-A=1 \Rightarrow A=-1$

$B=0$

$f(3) = 6$

۱ ۱ $\log_{2}^{5} \simeq 2{,}4$ ، $\log_{3}^{5} \simeq 1{,}4$

۷- هر ساعت $\frac{1}{9}$ را از دست می‌دهد ← در هر ساعت $\frac{8}{9}$ باقی می‌ماند

$\Rightarrow P(t) = P_0 \times \left(\frac{8}{9}\right)^t$

$P(t') = \frac{1}{4} P_0 \Rightarrow \cancel{P_0} \times \left(\frac{8}{9}\right)^t = \frac{1}{4} \times \cancel{P_0}$

$\Rightarrow \left(\frac{8}{9}\right)^t = \frac{1}{4}$

$\Rightarrow \log_{\frac{8}{9}}^{\frac{1}{4}} = t$

$$\Rightarrow t = \frac{-\log 4}{\log 8 - \log 9} = \frac{-\frac{10}{34} - \log_{10}^{3}}{\frac{30}{34} - 2\log_{10}^{3}} = \frac{-\frac{10}{34} - \frac{60}{119}}{\frac{30}{34} - \frac{120}{119}} = \frac{\frac{-35-60}{119}}{\frac{105-120}{119}}$$

$\log_{2}^{10} = \log_{2}^{5} + \log_{2}^{2} = 2{,}4 + 1 = 3{,}4 \Rightarrow \log_{10}^{2} = \frac{10}{34}$

$$\log_{10}^{3} = \frac{\log_{5}^{3}}{\log_{5}^{10}} = \frac{\frac{10}{14}}{\frac{34}{24}} = \frac{\cancel{240}^{\cancel{120}\ 60}}{\cancel{14}_{7} \times \cancel{34}_{17}} = \frac{60}{119}$$

$\log_{5}^{10} = \log_{5}^{5} + \log_{5}^{2} = 1 + \frac{10}{24} = \frac{34}{24}$

$\frac{-95}{-15} = \frac{19}{3}h$

$\Rightarrow \frac{19}{\cancel{3}} \times \cancel{60}^{20} = 380$

۳۸۰ دقیقه

۸- $P(t) = P_0 \times \left(\frac{7}{8}\right)^{\frac{t}{7}}$ ⇐ ۸۷٫۵ درصد باقی می‌ماند $\boxed{\text{در هفته}}$ ⇐ ۱۲٫۵ درصد از دست می‌دهد در هفته

یک هفته ۸ روز می‌باشد

$\log_{2}^{3} = 1{,}6$

$\log_{7}^{2} = 0{,}6$

$\Rightarrow \frac{1}{7}\cancel{P_0} = \cancel{P_0} \times \left(\frac{7}{8}\right)^{\frac{t}{7}} \Rightarrow \log_{\frac{7}{8}}^{\frac{1}{7}} = \frac{t}{7}$

$$\Rightarrow \frac{t}{7} = \frac{-\log_{3}^{7}}{\log_{3}^{7} - \log_{3}^{8}} = \frac{-\frac{10}{6}}{\frac{10}{6} - \frac{15}{8}} = \frac{-\frac{10}{\cancel{6}}}{\frac{40-45}{24}} = \frac{-40}{-5} = 8$$

$\log_{3}^{8} = 3\log_{3}^{2} = 3 \times \frac{5}{8} = \frac{15}{8}$

$t = 7 \times 8 = 56$ روز

$\log 2 = 0/3 \qquad \log 3 = 0/48$

۹- $P(t) = P_0 \times \left(\frac{96}{100}\right)^t \qquad P(t') = \frac{1}{3} P_0$

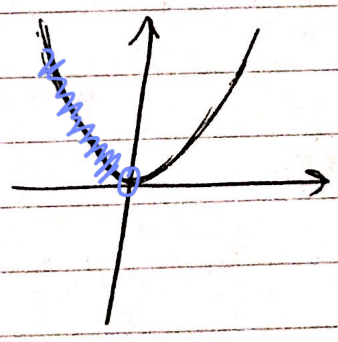
$\Rightarrow P_0 \times \left(\frac{96}{100}\right)^t = \frac{1}{3} P_0 \Rightarrow \log_{\frac{96}{100}} \frac{1}{3} = t$

$t = \frac{\log \frac{1}{3}}{\log \frac{96}{100}} = \frac{-\log 3}{\log 96 - \log 100} = \frac{-\log 3}{\underbrace{\log 2^5}_{5\log 2} + \log 3 - 2}$ ۲

$= \frac{-0/48}{1/5 + 0/48 - 2} = 24$

۱۰- الف) $y = 9^{\log_3 x} \Rightarrow y = x^{\log_3 9} = x^2$

$D = (0, +\infty)$



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ب) $y = \log x^2 = 2\log x$