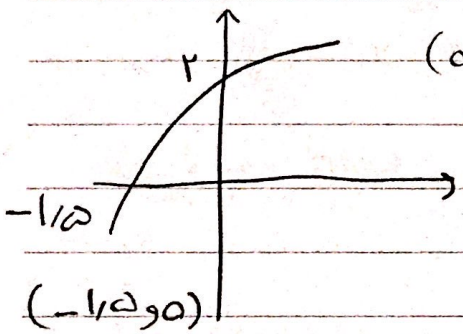
یازدهم ذهنه A — سایناسید محدی — تقلیب کاردک ۹۵

۱- $b+c=-\frac{۳}{۲}$

$y=۱-\log_c(ax-b)$

$(a+c)b=?$ ⇒ $(\frac{۳}{۲})\ x-۲=(-۳)$



$(۰,۲) \Rightarrow ۲=۱-\log_c^{-b}$

$\Rightarrow \log_c^{-b}=-۱ \Rightarrow -b=\frac{۱}{c}$

$\Rightarrow -\frac{۱}{c}+c=\frac{-۳}{۲}$

$\Rightarrow \frac{c^۲-۱}{c}=\frac{-۳}{۲} \Rightarrow ۲c^۲-۲=-۳c$

$\Rightarrow c^۲+۳c-۴=۰ \Rightarrow (c+۴)(c-۱)=۰$

روش ۲: $x^{-۲}$ → $c=\frac{-۴}{۲}$; → $c=\frac{۱}{۲}$ ✓

$c=\frac{۱}{۲}$ ، $c>۰$

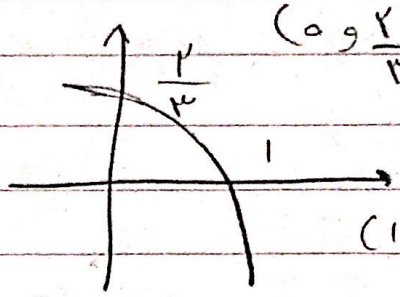
$b+\frac{۱}{۲}=\frac{-۳}{۲} \Rightarrow b=-۲$

$۱-\log_{۲^{-۱}}^{-۱/۵a+۲}=۰$

$\Rightarrow ۲^{-۱}=-۱/۵a+۲ \Rightarrow \frac{۱}{۲}=-\frac{۳}{۲}a+\frac{۴}{۲}$

$\Rightarrow \frac{۱}{۲}=\frac{۴-۳a}{۲} \Rightarrow a=۱$

۲.



$f(x) = ۱ + c \times ۳^{ax+b}$

$f(-۱) = ?$

$۱ + ۳^{a} c = \frac{۲}{۳} \Rightarrow ۳^{a} \times c = -\frac{۱}{۳} \Rightarrow -۳^{-۱} = ۳^{a} \times c$

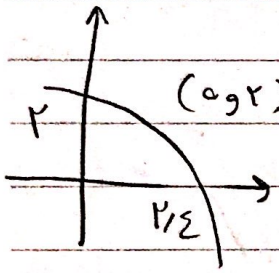
$\Rightarrow a = -۱ \quad , \quad c = -۱$

$۱ + -۳^{b-۱} = ۰ \Rightarrow ۱ = ۳^{b-۱} \Rightarrow b-۱ = ۰ \Rightarrow b = ۱$

$f(-۱) = ۱ + (-۳^{-۲}) = ۱ - \frac{۱}{۹} = \frac{۸}{۹}$

۳.

$y = c + \log_{۵}^{(ax+b)}$



$\Rightarrow c + \log_{۵}^{b} = ۲$

$\Rightarrow c + \log_{۵}^{۲٫۴a+b} = ۰$

از هم کم می‌کنیم $\Rightarrow \log_{۵}^{b} - \log_{۵}^{۲٫۴a+b} = ۲$

$\Rightarrow \log_{۵}^{\frac{b}{۲٫۴a+b}} = ۲ \Rightarrow ۲۵ = \frac{b}{۲٫۴a+b}$

$\Rightarrow b = ۶۰a + ۲۵b \Rightarrow ۶۰a = -۲۴b$

$\Rightarrow \frac{a}{b} = \frac{-۲۴}{۶۰} = \frac{-۲۴}{۶۰} = \frac{-۶}{۱۵} = \frac{-۲}{۵}$

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

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

$\sqrt{2}$ $\quad -\sqrt{2}$

x^2-2-x / $2-x^2-x$ / x^2-2-x

x^2-x-2 $\quad -x^2-x+2$ $\quad x^2-x-2$

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

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

$\hookrightarrow (-2, 1)$

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

$\Rightarrow$ ژ ق ق $\Rightarrow$ بازه $\Rightarrow$ قرارندارد $(-\sqrt{2}, \sqrt{2})$

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

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

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

$2b - a = ?$

$x = 1 \Rightarrow 2 + 2^{b-a} = 4$

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

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

و $\quad 2 + 2^{b+a} = 10 \Rightarrow b + a = 3$

$\Rightarrow (a = 1) \Rightarrow 4 - 1 = (3) = 2b - a$

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

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

$x = 1 \Rightarrow -2 + \frac{1}{2}^{A+B} = 0$

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

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

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

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

$\Rightarrow -2A - B = 2$

$(B = 0)$

$f(2) = 6$

$\log_2^5 = 2/4$ ، $\log_3^5 = 1/4$ ، $\log_2^3 = 1/6$

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

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

$$\Rightarrow P_0 \times \left(\frac{8}{9}\right)^t = \frac{1}{6} \times P_0$$

$$P(t') = \frac{1}{6} P_0$$

$$\Rightarrow \left(\frac{8}{9}\right)^t = \frac{1}{6}$$

$$\Rightarrow \log_{\frac{8}{9}}^{\frac{1}{6}} = t$$

$$\Rightarrow t = \frac{-\log 6}{\log 8 - \log 9} = \frac{-\log_{10}^{15} - \log_{10}^{4}}{\log_{10}^{8} - 2\log_{10}^{3}} = \frac{-\frac{15}{24} - \frac{6}{119}}{\frac{24}{24} - \frac{120}{119}} = \frac{\frac{-125-6}{119}}{\frac{119-120}{119}}$$

$$\log_2^{15} = \log_2^3 + \log_2^5 = 1 + 2/4 = 3/4 \Rightarrow \log_{10}^2 = \frac{15}{34}$$

$$\log_{10}^{15} = \frac{\log_3^{15}}{\log_3^{10}} = \frac{\frac{15}{24}}{\frac{24}{24}} = \frac{\frac{24 \times 15}{24}}{\frac{24 \times 24}{24}} = \frac{6}{119}$$

$$\log_3^{15} = \log_3^3 + \log_3^5 = 1 + \frac{15}{24} = \frac{34}{24}$$

$$\frac{-90}{-15} = \frac{19}{3} h$$

$$\Rightarrow \frac{19}{3} \times 60 = 380 \text{ دقیقه}$$

۸- $P(t) = P_0 \times \left(\frac{7}{8}\right)^{\frac{t}{7}}$ ← $\frac{1}{8}$ در هفته ۸ درصدی باشد ← در هفته ۸ درصد از دست می‌دهد

$\log_2^3 = 1/6$

$\log_3^5 = 1/4$

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

$$\Rightarrow \frac{t}{7} = \frac{-\log_3^7}{\log_3^7 - \log_3^8} = \frac{-\frac{15}{6}}{\frac{15}{6} - \frac{15}{8}} = \frac{-\frac{15}{6}}{\frac{60-45}{24}} = \frac{-40}{-5} = 8$$

$$\log_3^8 = 3\log_3^2 = 3 \times \frac{15}{24} = \frac{15}{8}$$

$t = 7 \times 8 = 56$ (ساعت)

$\log 2 = 0.3$ $\log 3 = 0.48$

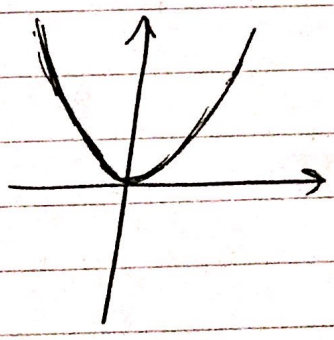
۹- $P(t) = P_0 \times \left(\frac{96}{100}\right)^t$ $P(t') = \frac{1}{3} P_0$

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

$$t = \frac{\log \frac{1}{3}}{\log \frac{96}{100}} = \frac{-\log 3}{\log 96 - \log 100} = \frac{-\log 3}{\underbrace{\log 32 + \log 3}_{5\log 2} - 2}$$

$$= \frac{-0.48}{1.5 + 0.15 - 2} = \frac{-0.48}{-0.35} = (34)$$

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



ب) $y = \log x^2 = 2\log x$