یازدهم دفتر / پنج شنبه (۱) — بهار نیاهی

Subject: Date: / /

①

$x=0 \rightarrow y = 1-\log_c^{-b} = 2 \rightarrow bc=-1$

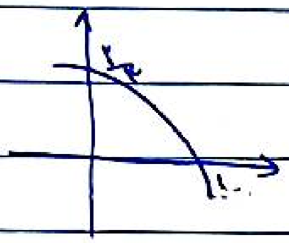
$\begin{cases} b+c = -\frac{3}{2} \\ bc=-1 \end{cases} \rightarrow \begin{cases} b=-2 \\ b=\frac{1}{2} \times \end{cases} \qquad c=\frac{1}{2}$

اگر باشد c منفی می‌شود

$x = -1{,}5 = -\frac{3}{2} \rightarrow 1-\log_{-\frac{1}{2}}^{-\frac{3}{2}a+2} = 0 \rightarrow \cancel{a} \rightarrow (a+c)b = \boxed{-3}$

②

$f(x) = 1 + c\times 3^{a+bx}$



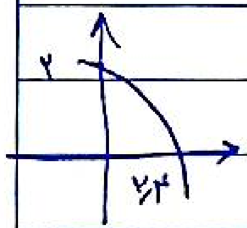
$1 + c\times 3^{a} = \frac{2}{3} \rightarrow c\times 3^{a} = -\frac{1}{3}$

$1 + c\times 3^{a+b} = 0 \rightarrow \underbrace{c\times 3^{a}}_{-\frac{1}{3}}\times 3^{b} = -1 \rightarrow 3^{b} = 3 \rightarrow b=1$

$f(-1) = 1 + c\times 3^{a}\times 3^{-1\times 1} = 1-\frac{1}{3}\times 3^{-1} = 1-\frac{1}{9} = \boxed{\frac{8}{9}}$

③

$y = c + \log_5^{(ax+b)}$



$c+\log_5^{2{,}4a+b} \longrightarrow 5^{-c} = 2{,}4a+b$

$\hookrightarrow \frac{b}{25} = 2{,}4a+b$

$2 = c+\log_5^{b} \rightarrow 5^{2-c} = b$

$\hookrightarrow \frac{25}{5^c} = b \rightarrow \frac{1}{5^c} = \frac{b}{25}$

$\frac{b}{25} - b = 2{,}4a$

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$-\frac{24b}{25} = 2{,}4a \rightarrow \boxed{\frac{a}{b} = \frac{-2}{5}}$

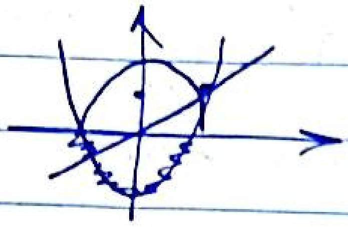
Subject: $x^2-2=0 \Rightarrow x=\pm\sqrt{2}$

Date: / /

۴

$f(x)=\log_2(|x^2-2|-x)$

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



$y_1=|x^2-2|$

$y_2=x$

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

نمودار y_2 زیر y_1 است

$-\sqrt{2}$	$+\sqrt{2}$	
$x^2-2>x$	$2-x^2>x$	
$x^2-2-x>0$	$x^2+x-2<0$	$x^2-2>x$
$(x-2)(x+1)>0$	$\downarrow$	$x^2-2-x>0$
$x=2,-1$	$(x+2)(x-1)=0$	
$-1\quad 2$	$x=-2,1$	$x=-2,+1$
$+\ -\ +$	$-2\quad 1$; $+\ -\ +$; $-2<x<1$	
$x>2$		
$x<-1$		

۵

$f(x)=2+2^{b-ax}$ $\qquad g(x)=-x^2-3x+8$

$f^{-1}(10)=-1$ $\qquad g(1)=-1-3+8=4$

$f(-1)=10$ $\qquad f(1)=4$

$f(-1)=2^{b+a}+2=10$ $\qquad f(1)=2+2^{b-a}=4$

$\downarrow$ $\qquad \downarrow$

I $b+a=3$ $\qquad$ II $b-a=1$

$\{$ I $+$, II

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$b=2,\ a=1 \longrightarrow 2b-a=4-1=\boxed{3}$

Subject:

Date: / /

(6)

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

$f(1) = -2 + \frac{1}{2}^{A+b} = 1 - 1 \rightarrow \frac{1}{2}^{A+b} = 2 \rightarrow A + b = -1$

$f(2) = -2 + \frac{1}{2}^{2A+b} = 4 - 2 \rightarrow \frac{1}{2}^{2A+b} = 4 \rightarrow 2A + b = -2$

$A = -1 , B = 0$

$f(3) = -2 + \frac{1}{2}^{-3+0} = \boxed{6}$

(7)

$1 - \frac{1}{9} = \frac{8}{9}$ $\cancel{m\times}\left(\frac{8}{9}\right)^{t} = \frac{1}{6}\cancel{\times m}$ $\log_{2}^{5} = 2{,}3 \rightarrow \log_{5}^{2} = \frac{10}{23}$

$\hookrightarrow t \log_{5}^{\frac{8}{9}} = -\log_{5}^{6}$ $\log_{3}^{5} = 1{,}4 \rightarrow \log_{5}^{3} = \frac{10}{14}$

$\leftarrow$

$t\left(3\log_{5}^{2} - 2\log_{5}^{3}\right) = -\left(\log_{5}^{2} + \log_{5}^{3}\right)$

$t\left(3 \times \frac{10}{23} - 2 \times \frac{10}{14}\right) = -\left(\frac{10}{23} + \frac{10}{14}\right)$ $t = \frac{19}{3}$

$\hookrightarrow t \times \frac{10}{56} = \frac{95}{84}$

$\frac{19}{3} \times 60 = \boxed{380 \text{ min}}$

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Subject: Date: / /

۸

$$\frac{100}{100} - \frac{12.5}{100} = \frac{87.5}{100} = \frac{7}{8}$$

$$\cancel{m}\left(\frac{7}{8}\right)^{t} = \frac{1}{7}\cancel{m} \qquad \log_{3}^{2} = \frac{10}{12} \Leftarrow \log_{2}^{3} = 1.2$$

$$\log_{7}^{3} = 0.6 \Rightarrow \log_{3}^{7} = \frac{10}{6}$$

$$t \log_{3}^{\frac{7}{8}} = -\log_{3}^{7}$$

$$t(\log_{3}^{7} - \log_{3}^{8}) = -\log_{3}^{7}$$

$$t(\log_{3}^{7} - 3\log_{3}^{2}) = -\log_{3}^{7}$$

$$t\left(\frac{10}{6} - 3 \times \frac{10}{12}\right) = -\frac{10}{6}$$

$$t\left(\frac{10}{6} - \frac{30}{12}\right) = -\frac{10}{6} \rightarrow t = \frac{5}{3} \times \frac{24}{5} = 8 \text{ هفته}$$

$$\boxed{t = 56 \text{ روز}}$$

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Subject: Date: / /

(9)

$\log 3 = 0{,}48$

$\log 2 = 0{,}3$

$\frac{100}{100} - \frac{4}{100} = \frac{96}{100} = \frac{24}{25}$ $\quad \cancel{x}\left(\frac{24}{25}\right)^n = \frac{1}{3}\cancel{x}$

$\log 5 = \cancel{\log} 10 - \cancel{\log} 2 = 0{,}7$

$n(\log 24 - \log 25) = -\log 3$

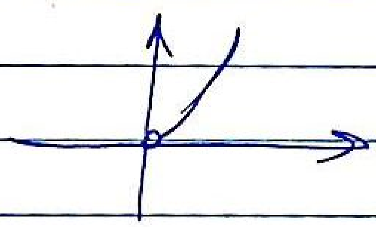
$\rightarrow n\,(3\log 2 + \log 3 - 2\log 5) = -0{,}48$

$3 \times 0{,}3 \quad + 0{,}48 \quad - 2 \times 0{,}7$

$(0{,}02)\,n = -0{,}48 \rightarrow n = 24$

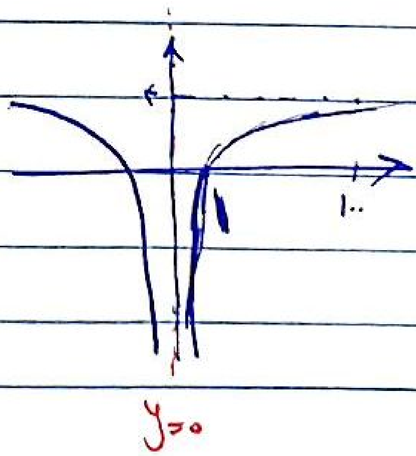
(10)

الف) $y = 9^{\log_3 x} \rightarrow x \in (0, +\infty) \rightarrow y = x^{\log_3 9} = x^2$



ب) $y = \log x^2 \rightarrow x \in \mathbb{R} - \{0\}$

$\hookrightarrow y = 2\log x$



$y = 0$