۱-

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

$۲ = 1 - \log_c^{-b} \Rightarrow 1 = -\log_c^{-b} \quad \log_c^{-b} = -1 \Rightarrow c^{-1} = -b \Rightarrow \frac{1}{c} = -b$

$b + c = -\frac{۳}{۲} \Rightarrow c + (-\frac{1}{c}) = -\frac{۳}{۲} \Rightarrow \frac{۳}{۲} = \frac{1}{c} - c \Rightarrow c^۲ + \frac{۳}{۲}c - 1 = 0$

$\frac{-b \pm \sqrt{\Delta}}{۲a} = \frac{-\frac{۳}{۲} \pm \frac{۵}{۲}}{۲} \Rightarrow c \begin{cases} \frac{1}{۲} \Rightarrow ✓ \\ -۲ \Rightarrow X \end{cases}$ غ ق ق

$\boxed{c = \frac{1}{۲}} \Rightarrow \boxed{b = -۲}$

$y = 1 - \log_{\frac{1}{۲}}^{ax+۲} \Rightarrow 0 = 1 - \log_{\frac{1}{۲}}^{-\frac{۳}{۲}a+۲} \Rightarrow$

$1 = \log_{\frac{1}{۲}}^{-\frac{۳}{۲}a+۲} \Rightarrow \frac{1}{۲} = -\frac{۳}{۲}a + ۲ \quad -\frac{۳}{۲} = -\frac{۳}{۲}a$

$\boxed{a = 1}$

$(a+c)b = (1 + \frac{1}{۲}) \cdot -۲ = -\frac{۶}{۲} = -۳$

-۳

۲-

$f(x) = 1 + c \times ۳^{a+bx} \Rightarrow \left. \begin{array}{l} 0 = 1 + c \times ۳^{a+b} \\ \frac{۲}{۳} = 1 + c \times ۳^{a} \end{array} \right] \Rightarrow \frac{۲}{۳} = c \times ۳^a (1 - ۳^b)$

$\frac{۲}{۳} = 1 + c \times ۳^a$

$-\frac{1}{۳} = c \times ۳^a$

$0 = 1 + c \times ۳^a \times ۳^b \Rightarrow 0 = 1 + ۳^b \times -۳^{-1} \Rightarrow 1 = ۳^{b-1} \Rightarrow b - 1 = 0$

$\boxed{b = 1}$

$x = 1 \Rightarrow 1 + c \times ۳^{a+1} \Rightarrow 1 - \frac{1}{۳} \times ۳^{-1} \Rightarrow 1 - \frac{1}{۹} = \frac{۸}{۹}$

۳_

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

$2 = c + \log_5^{b}$ (1)

$0 = c + \log_5^{2/1a+b} \Rightarrow c = -\log_5^{2/1a+b}$ (2)

(1)
(2) $\Rightarrow 2 = \log_5^{b} - \log_5^{2/1a+b} \Rightarrow 2 = \log_5^{\frac{b}{2/1a+b}} \Rightarrow$

$\frac{b}{2/1a+b} = 25 \Rightarrow 52.a + 25b = b$

$52.a = -24b$

$5a = -2b$

$a = -\frac{2}{5}b$

$\frac{a}{b} = \frac{-\frac{2}{5}b}{b} = -\frac{2}{5} = -0/4$

۴_

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

$|x^2 - 2| > x$

$x > \sqrt{2}$ یا $-\sqrt{2} x$

$x^2 - 2 > x \Rightarrow$

$x^2 - x - 2 > 0$

$x_1 = -1$

$x_2 = 2$

$-1 \quad 2$

$+ \quad - \quad +$

$-\sqrt{2}$ $\Rightarrow$

$D_x = (-\infty, -\sqrt{2}] \cup [2, +\infty)$ (1)

$-\sqrt{2} < x < \sqrt{2}$

$2 - x^2 > x$

$0 > x^2 + x - 2$

$x_1 = 1$

$x_2 = -2$

$-2 \quad 1$

$+ \quad - \quad +$

$-\sqrt{2} < x < \sqrt{2} \Rightarrow D_x = [-\sqrt{2}, 1)$ (2)

(1) $\cup$ (2) =

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

$D_x: R - [1, 2]$

۵-

$f(x) = ۲ + ۲^{b-ax}$ $\quad f(۱۰) = ۱۰$

$g(x) = -x^۲ + ۴x + ۸$ $\quad f(-۱) = ۱۰$

$۱۰ = ۲ + ۲^{b+a}$

$۸ = ۲^{b+a} \Rightarrow \boxed{b+a = ۳}$

$۲ + ۲^{b-a} = -۱ + ۴ + ۸$

$۲^{b-a} = ۴ \Rightarrow \boxed{b-a = ۱}$

$\left.\begin{matrix} b+a = ۳ \\ b-a = ۱ \end{matrix}\right] \Rightarrow$ $b = ۲$, $a = ۱$ $\quad$ ۴

$۲b - a = ۴ - ۱ = ۳$

۶-

$f(x) = -۲ + (\frac{۱}{۲})^{Ax+B}$

$y = x^۲ - x$ $\quad \overset{x=۱}{\Rightarrow} ۰ = -۲ + \frac{۱}{۲}^{B+A}$

$۲ = \frac{۱}{۲}^{B+A} \Rightarrow \boxed{B+A = -۱}$

$A + B = -۱$

$\overset{x=۲}{\Rightarrow} ۴ - ۲ = -۲ + \frac{۱}{۲}^{۲A+B}$

$۴ = \frac{۱}{۲}^{۲A+B} \Rightarrow \boxed{۲A+B = -۲}$

$\left.\begin{matrix} ۲A + B = -۲ \\ A + B = -۱ \end{matrix}\right] \Rightarrow A = -۱$

$B = ۰$

$f(x) = -۲ + \frac{۱}{۲}^{-x} \Rightarrow f(۳) = -۲ + \frac{۱}{۲}^{-۳} = ۶$

$\boxed{f(۳) = ۶}$

۲۰ از ۲۰

۷ـ ۳۸۰

$\frac{8}{9}$ ماند — $\frac{1}{9}$ مصرف

$$\left(\frac{8}{9}\right)^x = \frac{1}{5} \Rightarrow \log_{\frac{8}{9}}^{\frac{1}{5}} = x$$

$\log_2^5 = 2.4 , \log_5^2 = \frac{1}{2.4}$

$\log_5^3 = \frac{1}{1.4}$

$$-\log_{\frac{8}{9}}^{5} = x$$

$$\log_{\frac{9}{8}}^{5} = x$$

$$\frac{\log_5^5}{\log_5^{\frac{9}{8}}} = \frac{\log_{\frac{9}{8}}^5}{\log_5^5} = \frac{\log_5^2 + \log_5^3}{\log_5^3 \cdot \log_5^3 - \log_5^2 \cdot \log_5^2 \cdot \log_5^2} = \frac{\log_5^2 + \log_5^3}{2\log_5^3 - 3\log_5^2} =$$

$$\frac{\frac{1}{2.4} + \frac{1}{1.4}}{\frac{2}{1.4} - \frac{3}{2.4}} = \frac{\frac{3.8}{3.36}}{\frac{4.8 - 4.2}{3.36}} = \frac{3.8}{0.6} = \frac{38}{6} = \frac{19}{3}$$

$\frac{19}{3}$ ساعت

$\frac{19}{3} \times 60 = 20 \times 19 = 380$ دقیقه ۳۸۰

۸ـ

$\frac{1}{8}$ مصرف $\frac{7}{8}$

$$\left(\frac{7}{8}\right)^x = \frac{1}{7}$$

$\log_2^3 = 1.6$

$\log_3^2 = \frac{5}{8}$

$\log_3^7 = \frac{5}{3}$

$$x = \log_{\frac{7}{8}}^{\frac{1}{7}} \Rightarrow x = \log_{\frac{8}{7}}^{7} = \frac{\log_3^7}{\log_3^{\frac{8}{7}}} = \frac{\log_3^7}{3\log_3^2 - \log_3^7} =$$

$$\frac{\frac{5}{3}}{\frac{15}{8} - \frac{5}{3}} = \frac{\frac{5}{3}}{\frac{45 - 40}{24}} = 8$$ هفته

$8 \times 7 = 56$

۵۶ روز

۹ـ

هر روز $\frac{4}{100}$ $\qquad \frac{96}{100} \qquad \frac{96}{100} = \frac{24}{25}$

$$\left(\frac{24}{25}\right)^x = \frac{1}{3} \Rightarrow \log_{\frac{24}{25}} \frac{1}{3} = x = \log_{\frac{25}{24}} 3 = \frac{\log_{10} 3}{\log_{10} \frac{25}{24}} =$$

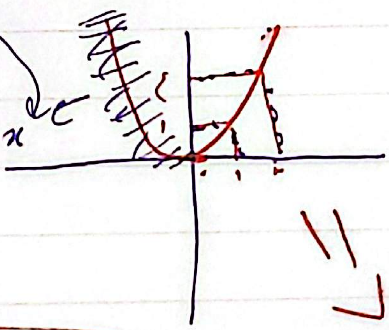
$$\frac{\log_{10} 3}{\log 5^2 - \log 3 - 3\log 2} = \frac{\log 3}{2\log 5 - 3\log 2 - \log 3} = \frac{\log 3}{2\log 10 - 2\log 2 - 3\log 2 - \log 3} =$$

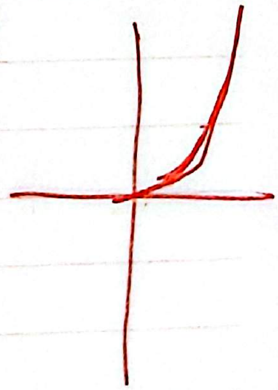
$$\frac{\log 3}{2 - 5\log 2 - \log 3} = \frac{0.48}{2 - 1.5 - 0.48} = \frac{0.48}{0.02} = 24$$

$\boxed{\text{۲۴ روز}}$

۱۰ـ

الف) $y = 9^{\log_3 x} = x^{\log_3 9} = x^2$, $0 < x$





ب) $\log x^2 = 2\log|x|$ زیرا x منفی هم می‌تواند باشد