۱ $y=x^2$ ⟵ $(1,1)$ و $(3,9)$

3^{An+B} → ابتدا → $3^{A+B}=1$ → $A+B=0$

→ بعد → $3^{3A+B}=9$ → $3A+B=2$ → $2A=2$ → $A=1$ → $B=-1$

اگر صفر بدهیم ⟵ $3^{-1}=\frac{1}{3}$

۲ $\log_{\frac{1}{2}}^{(\xi^{n+1}+1)}=n+3 \rightarrow 2^{n+3}=\xi^{n+1} \rightarrow 2^{n+3}=2^{2n+2} \rightarrow n+3=2n+2 \rightarrow n=1$

۳ $\log_{12}^{3}=a \quad \log_{12}^{8}=1-a$

$(\log_{12}^{3})^2+\log_{12}^{(12^7)}\times\log_{12}^{(12^3\times 4)}=$

$\log_{12}^{2}+\log_{12}^{8}$ × $\log_{12}^{3}+\log_{12}^{4}$

$\frac{a+2-2a}{(2-a)}$ $\frac{-2a+2-2a}{(a+2)}$ → $(2+a)(2-a)=(4-a^2)+(a^2)=4$

۴ مقدار $\log_{3}^{(-x)}=?$

$\log_{10}^{x^2-2x+1}+2\log_{10}^{(1-x)}=5$

↓

$\log_{10}^{(1-x)^2}=2\log_{10}^{1-x}+2\log_{10}^{1-x}=5 \rightarrow 5\log_{10}^{1-x}=5 \rightarrow 1-x=10 \rightarrow x=-9$

$\log_{3}^{6+9}=2\log_{3}^{3}=2$

۵ $\log_{2}^{7}=a$ و $\log_{2}^{3}=b$ ⟵ $\log_{2}^{(x^2+2x+4)}+\log_{2}^{(x-2)}=3$ ؟ $=\log_{\frac{1}{2}x}^{x}$

$(x-2)(x^2+2x+4)=7$

$x^3-8=7 \rightarrow x^3=15$ → $\log_{\frac{1}{2}x}^{x}=2\log_{x}^{x}$ → $\log_{x^2}^{x^2}=\log_{12}^{12}+\log_{2}^{2}=4$

۶ $\log_{(x-2)}^{(x-2)}-\log_{(x-2)^2}^{\frac{1}{(x-2)^2}}=3 \rightarrow \frac{\frac{1}{x-2}}{\frac{1}{(x-2)^2}}=\frac{1}{(x-2)^3}=1000$

$(x-2)^3=(-2)^3$

$x-2=-10$

$x=-8$ → $\log_{12}^{(-x)}=2\log_{8}^{8}=2\log_{2}^{2}=2$

x^3+x^2-3x-1

$(x-1)(x^2-3+x)$

$x^3-x^2-12x+7+4x^2-4x-1=1000 \longleftarrow x^3+3x^2-4x+4x^2-4x+1=1000$

$x^3-12x-993=0$

$\log_{2}^{6}=\log_{2}^{2}+\log_{2}^{3}=1+b$

۸ $y = 17 - 2x^3$ — $y^{(-3)} = ?$ dy^4

$x = 3$ ، $x = -2$ ← $x^3 - 2x - 4 = 0$

$\frac{6y+4}{4} \to \frac{3y+2}{2}$ ، $\frac{3y-4}{2} \to 2y-4$ ، $x = -2$ ← $x^3 - 2x - 4 = 0$

$\Delta = 4 + 8 = 12$ ، $\frac{3y+2}{2} \to 2y+1$

$dy^4 = \frac{1}{2} dy^2 = \boxed{\frac{1}{4}}$ ← $dy^{(-3)} = \frac{1}{4}$

۷ $dy^2 = \frac{7}{5}$ — $dy^{11} = ?$ ← $\frac{dy^{11}}{dy^8} = \frac{dy^8}{dy^7} \times dy^7$

$\frac{dy^8}{dy^7} = \frac{3dy^2 + 3dy^2 + 4dy^2}{3dy^2 + 2dy^2 + dy^2} = \frac{10dy^2}{6dy^2} = \frac{5}{3}$

$\frac{dy^7}{dy^6} = \frac{7}{12}$ ← $dy^6 = dy^5 + dy^4$

$dy^{11} = \frac{35}{36} dy^7$

۹ $dy^3 = 10$ — $dy^{12} = ?$

$dy^3 = 10 dy^2$ ← $dy^2 = \frac{1}{10} dy^3$

$dy^{12} = 8dy^2 + 4dy^2 = 12dy^2$

$\frac{dy^{12}}{dy^{11}} = \frac{12}{11}$ ← $dy^{11} = 11dy^2$

$\frac{dy^{11}}{dy^{10}} = \frac{11}{10}$ ← $dy^{10} = 10dy^2$

$\frac{dy^{10}}{dy^9} = \frac{10}{9}$ ← $dy^9 = 9dy^2$

$\frac{dy^9}{dy^8} = \frac{9}{8}$ ← $dy^8 = 8dy^2$

$\frac{dy^8}{dy^7} = \frac{8}{7}$ ← $dy^7 = 7dy^2$

$\frac{dy^7}{dy^6} = \frac{7}{6}$ ← $dy^6 = 6dy^2$

$\frac{dy^6}{dy^5} = \frac{6}{5}$ ← $dy^5 = 5dy^2$

$\frac{dy^5}{dy^4} = \frac{5}{4}$ ← $dy^4 = 4dy^2$

$\frac{dy^4}{dy^3} = \frac{4}{3}$ ← $dy^3 = 3dy^2$

$\frac{dy^{12}}{dy^4} = \frac{12}{4} = 3$

۱۰ $ax^2 + bx + c = 0$ — ریشه‌ی عکس‌شان $= -1$

$cx^2 + bx + a = 0$

$a + b + a = 0$ ← $x = 1$

$2a + b = 0$

$\frac{a+b}{a} = dy^2_{10}$ ← $(a+b)dy^2_{10} = a$

$(\sqrt{2})^{\frac{b}{a}}$

$\downarrow$

$(\frac{b}{a})^{\frac{1}{2}}$

$= (\frac{2a}{a})^2$