

بانک سوال رایگان

+ پاسخ
تشریحی

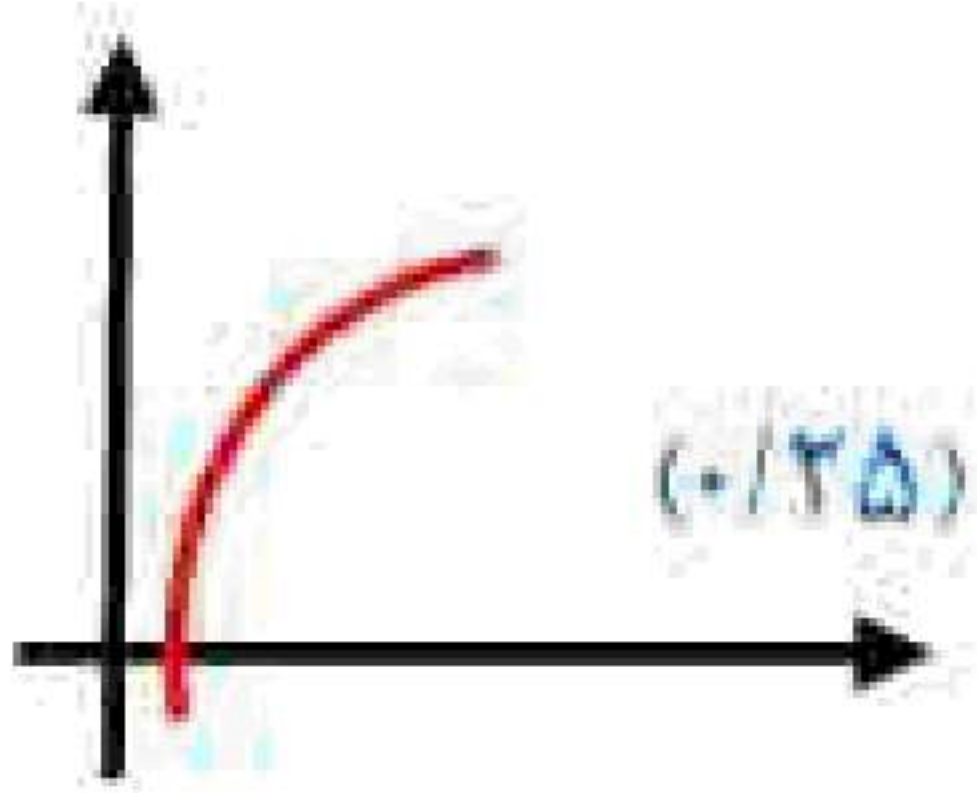
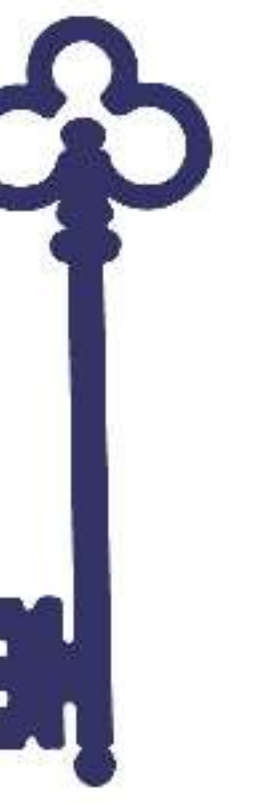
یاوران دانش



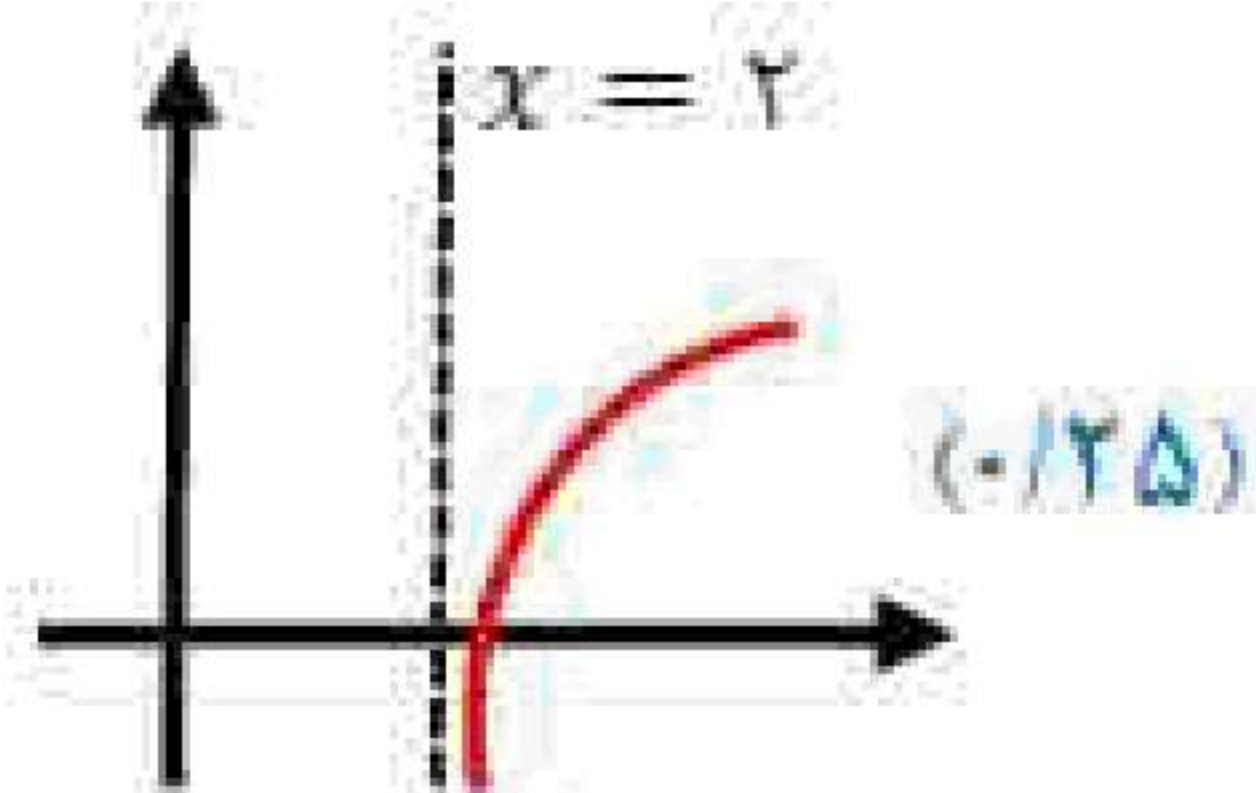
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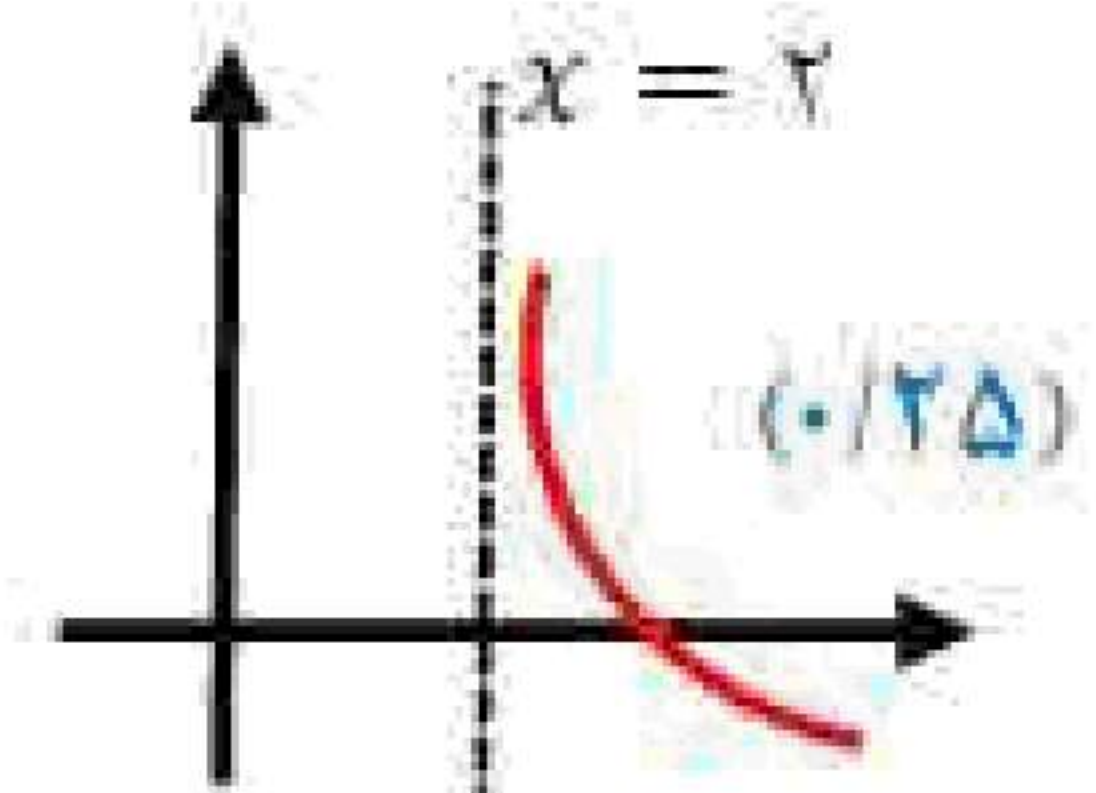
۰۲۱ ۹۱۶ ۹۲۱ ۴۰



$$y = \log_7 x$$



$$y = \log_7 (x - 2)$$



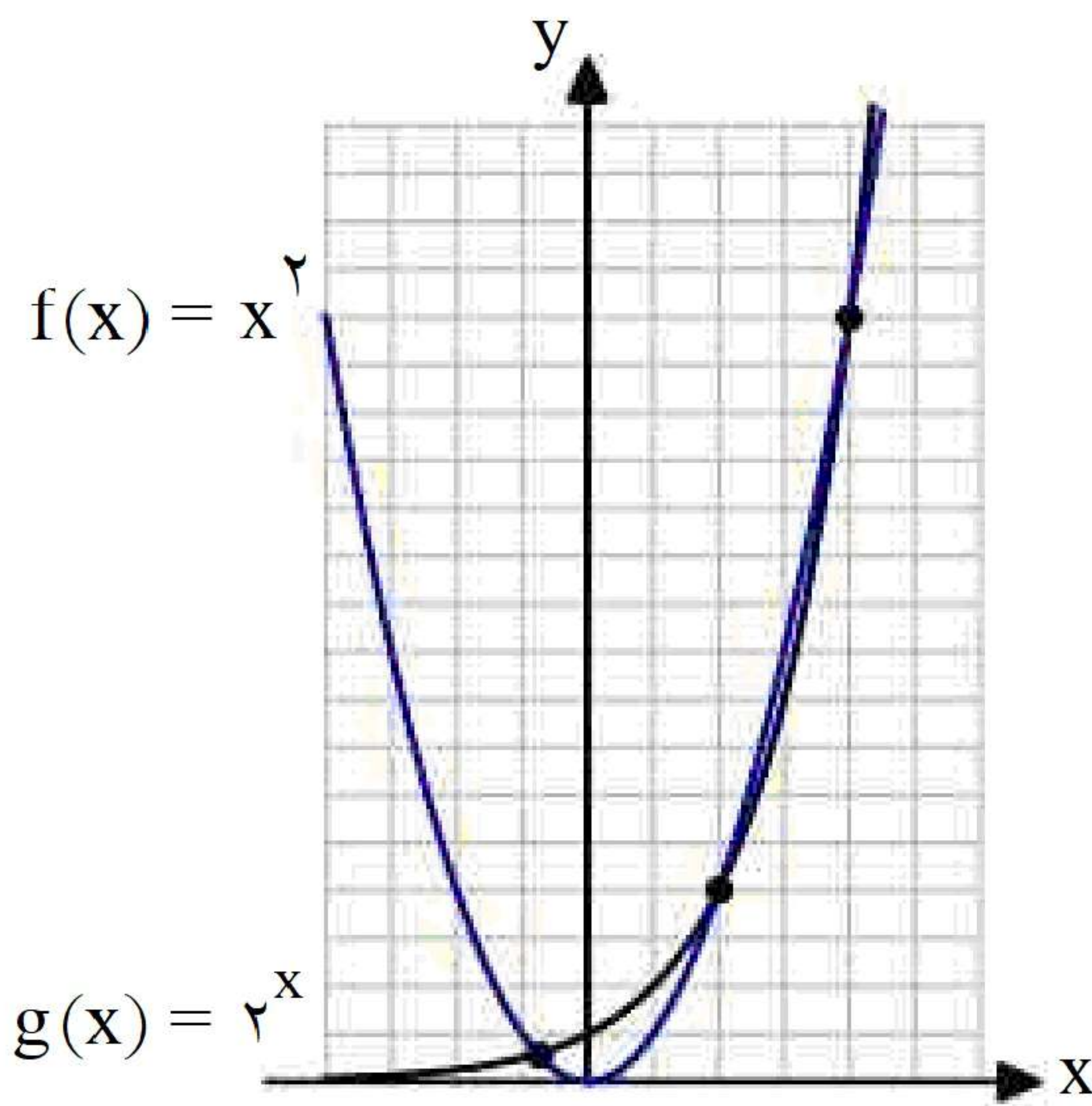
$$y = -\log_7 (x - 2)$$

-۱

$$\begin{aligned} \text{Log } \sqrt{30} &= \frac{1}{2} \text{Log } (2 \times 3 \times 5) = \frac{1}{2} (\text{Log } (2) + \text{Log } (3) + 1 - \text{Log } (2)) = \frac{1}{2} (1 + \text{Log } 3) \\ &= \frac{1}{2} (1 + 0.477) = \frac{3}{4} \end{aligned} \quad -2$$

$$\text{الف) } 4^{3x+2} = 4^{-3x} \Rightarrow 3x+2 = -3x \Rightarrow x = \frac{-1}{3} \quad -3$$

$$\text{ب) } \text{Log } \frac{(x+1)}{x-3} = 3 \Rightarrow \frac{x+1}{x-3} = 10^3 \Rightarrow x+1 = 1000(x-3) \Rightarrow x = \frac{2999}{999} \quad \text{قابل قبول}$$



-۴

سه نقطه

-۵ (۱, ۱)

$$\text{Log } x(x-2) = 3 \Rightarrow x(x-2) = 10^3 = 1000 \Rightarrow x^2 - 2x - 1000 = 0$$

-۶

$$\Rightarrow x = -2 \text{ (غ ق) یا } x = 4$$

$$\text{Log } 125 = \text{Log } 5^3 = 3 \text{Log } 5 = 3 \left(\text{Log } \frac{10}{2} \right) = 3 (\text{Log } 10 - \text{Log } 2) = 3 (1 - 0.301) = 2.097 \quad -7$$



$$f(0) = -\frac{8}{9} \Rightarrow 3^{-2} + b = -\frac{8}{9} \Rightarrow b = -1 \quad -8$$

$$f(2) = 0 \Rightarrow 3^{ax-2} - 1 = 8 \Rightarrow 3^{2a-2} = 9 = 3^2 \Rightarrow 2a-2 = 2$$

$$a = 2 \quad (\text{ص ۱۰۳ و ۱۰۴})$$

$$f^{-1}(x) = \log_2 x - 9$$

-۴-۱۰

$$\log_3(x-1) + \log_3(x+7) = 2 \log_3(x+1) \Rightarrow \log_3(x-1)(x+7) = \log_3(x+1)^2 \quad -11$$

$$\Rightarrow x^2 + 6x - 7 = x^2 + 2x + 1 \Rightarrow x = 2 \quad \text{ق ق}$$

$$A = \log \frac{5}{2} = \log \frac{10}{4} = \log 10 - \log 4 = 1 - 2 \log 2 = 0.4 \quad -12$$

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-۱۳ $(-1, +\infty)$

-۱۴ درست

$$\frac{9}{\sqrt[4]{27}} = \frac{3^2}{3^{3/4}} = 3^{5/4} \quad -15$$

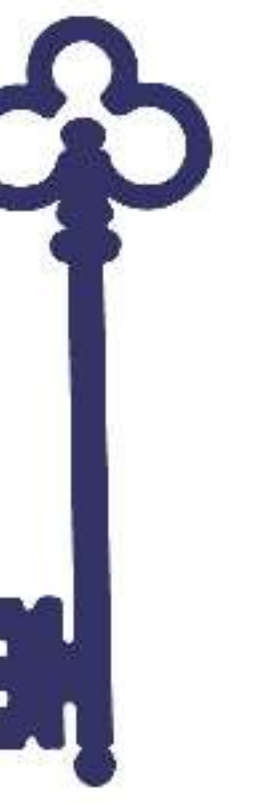
$$A = \log_3 \frac{9}{\sqrt[4]{27}} + \log 0.001 = \frac{5}{4} + (-3) = -\frac{7}{4}$$

$$\log_3(x-1) + \log_3\left(\frac{x}{2}+1\right) = 2 \Rightarrow (x-1)\left(\frac{x}{2}+1\right) = 3^2 \Rightarrow \frac{x^2}{2} + \frac{x}{2} - 1 = 9 \quad -16$$

$$\Rightarrow x^2 + x - 20 = 0 \Rightarrow x = 4 \quad \text{ق ق}, x = -5 \quad \text{غ ق ق}$$

$$\left(\frac{1}{3}, -2\right) \xrightarrow{\quad} -2 = 2 + \log_a \frac{1}{3} \Rightarrow \log_a \frac{1}{3} = -4 \Rightarrow a^{-4} = \frac{1}{3} \Rightarrow a = \sqrt[4]{3} \quad -17$$

-۱۸ بیشتر

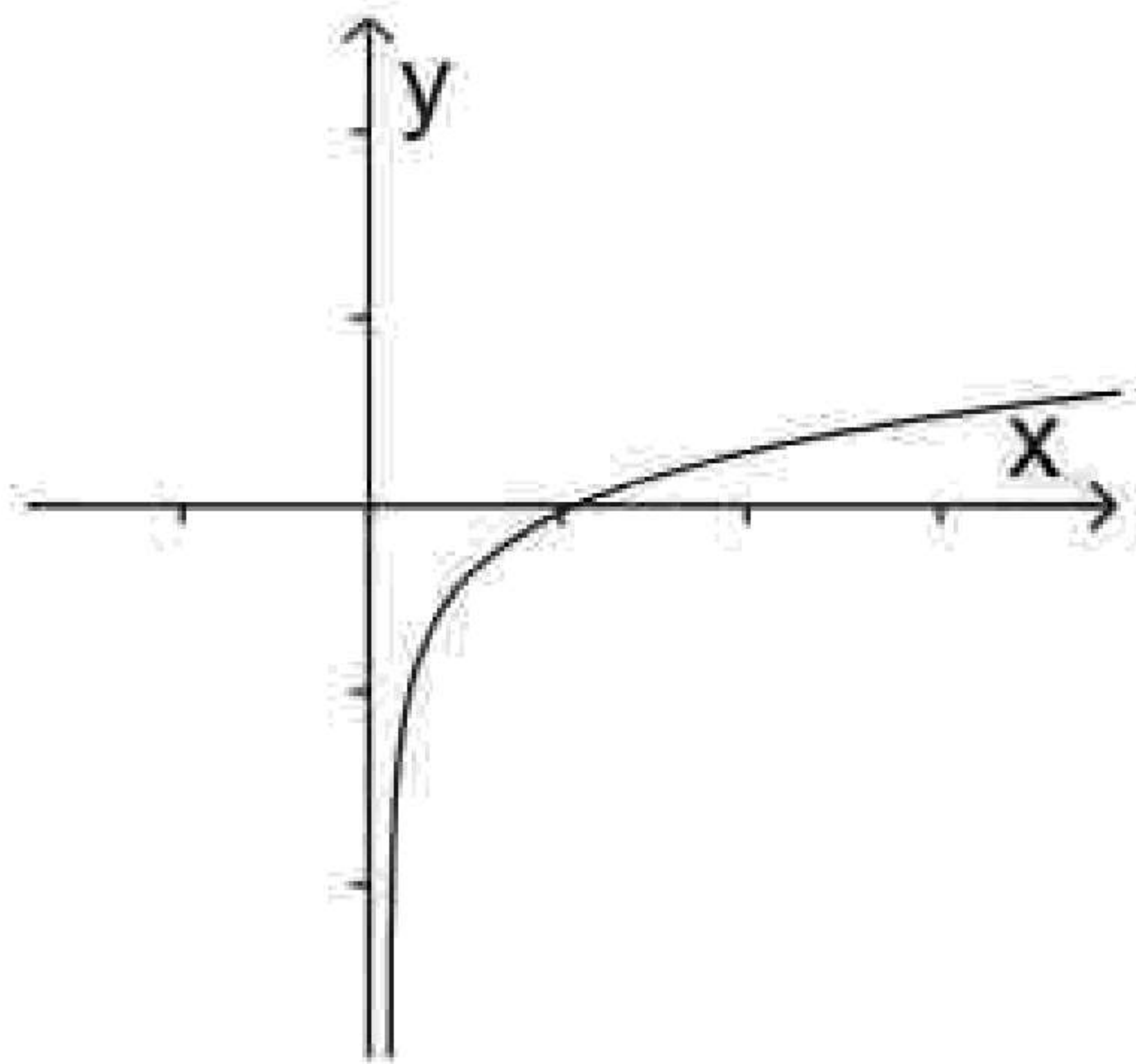


۱۹- نادرست

$$1 = \log_a 9 - 1 \Rightarrow a^2 = 9 \Rightarrow a = 3$$

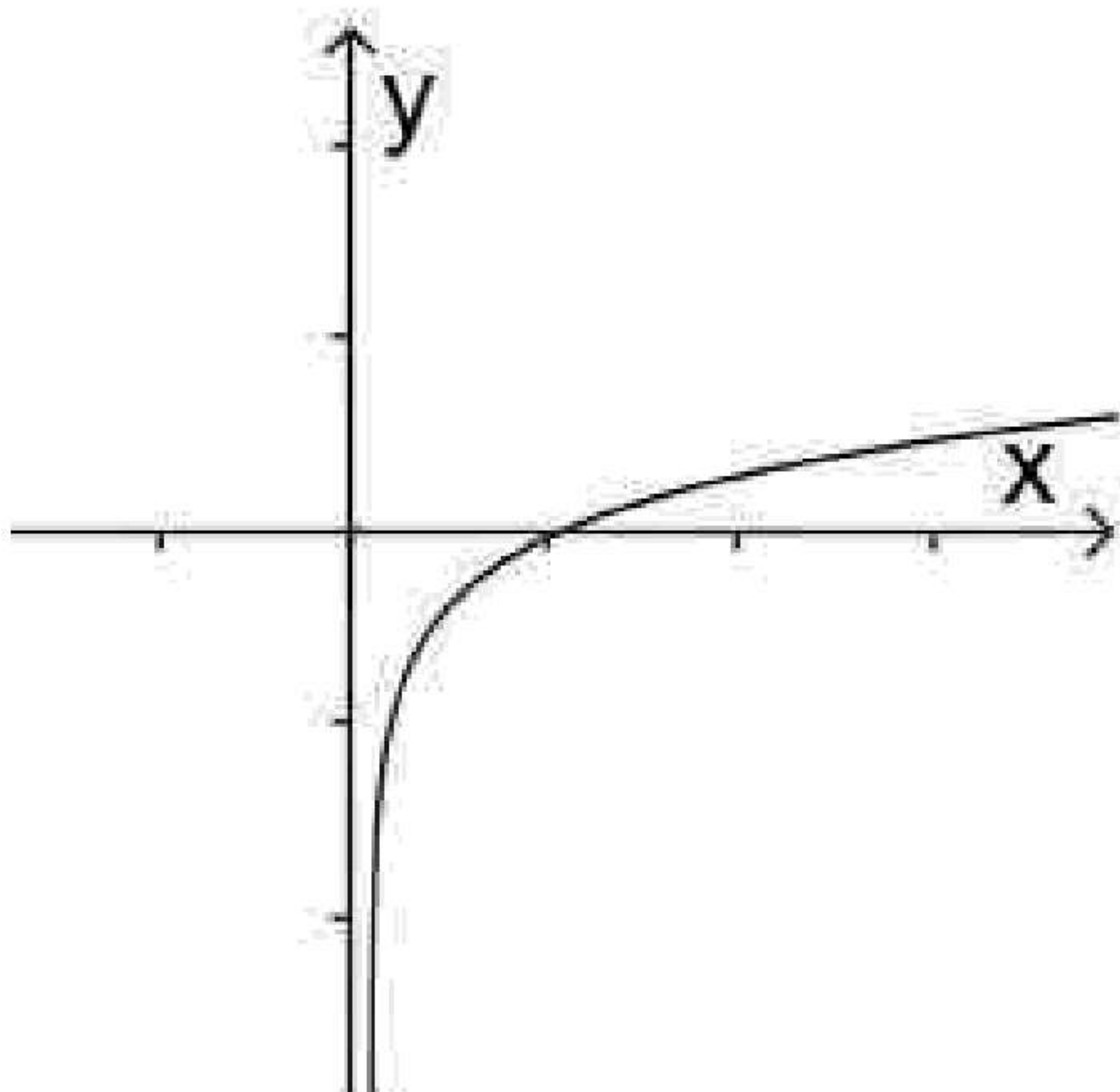
۲۰- الف)

ب)



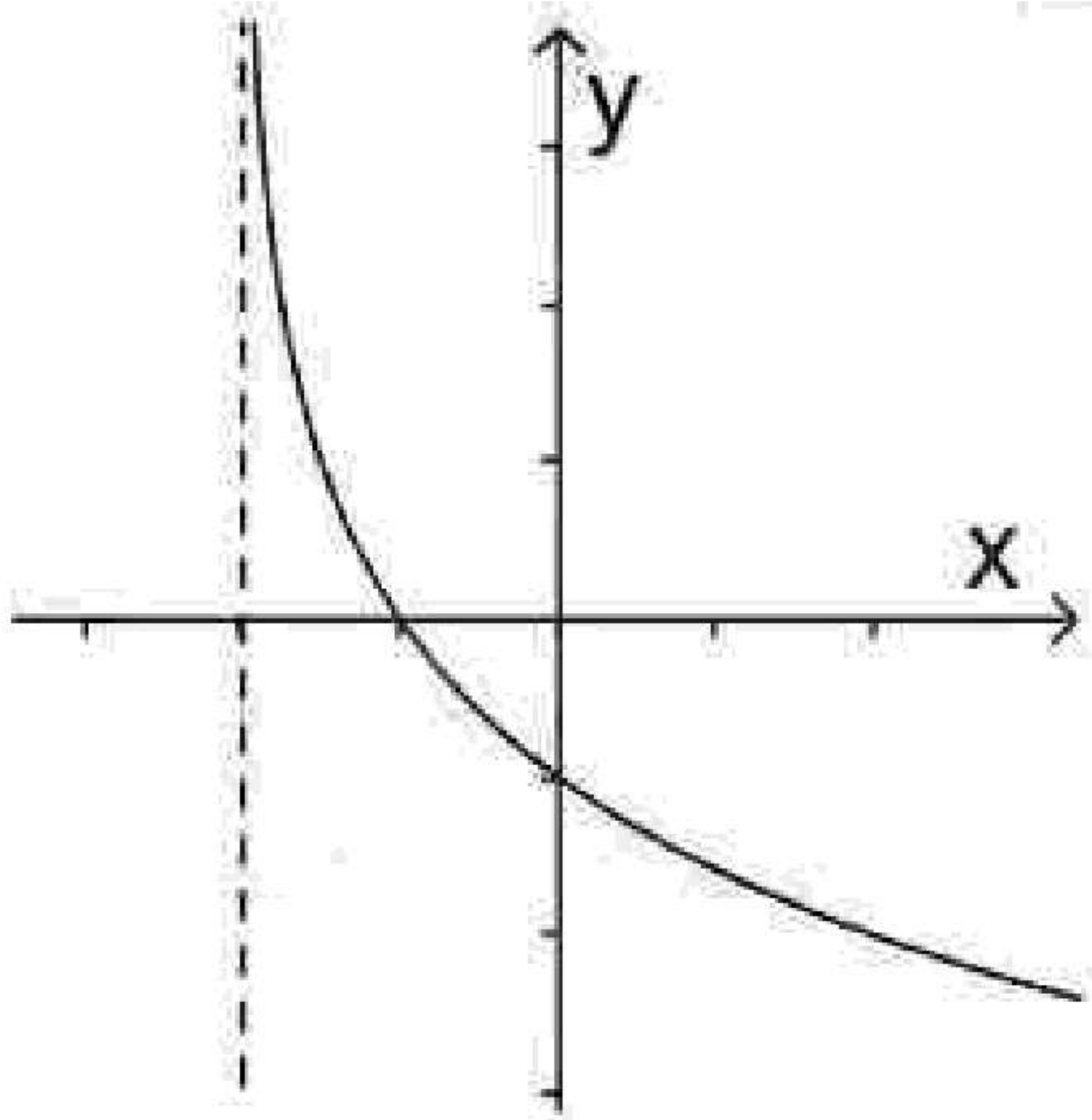
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۲۱- الف)



ب)

$$3 = \log_a 8 \Rightarrow a^3 = 8 \Rightarrow a = 2$$



-۲۲

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

$$\frac{2}{3} \log 12 = \frac{2}{3} (\log 3 + \log 4) = \frac{2}{3} (0.5 + 2 \times 0.3) = \frac{11}{15}$$

-۲۳

$$\frac{1}{3} \log \frac{3}{4} = \frac{1}{3} (\log 3 - \log 4) = \frac{1}{3} (\log 3 - 2 \log 2) = -\frac{1}{30}$$

-۲۴

-۲۵ درست.

$$\log(x+2) = \log \frac{1}{x-5} \Rightarrow x+2 = \frac{1}{x-5} \Rightarrow x^2 - 3x - 18 = 0$$

(۲۶-الف)

$$x_1 = 6, x_2 = -3 \text{ غ ق ق}$$

$$\log 400 = 2 \log 2 + \log 100 = 0.6 + 2 = 2.6$$

(ب)

$$2^{4x+8} = 2^{-6} \Rightarrow 4x+8 = -6 \Rightarrow x = -\frac{7}{2}$$

-۲۷

$$3^{2x-1} = \frac{1}{27} \Rightarrow 3^{2x-1} = 3^{-3} \Rightarrow 2x-1 = -3 \Rightarrow x = -1$$

-۲۸

$$(-3, +\infty)$$

$$(-\infty, +\infty) \text{ -۲۹}$$

۳۰- خیر. زیرا دامنه‌ها برابر نیستند.

$$D_f = \mathbb{R} - \{0\}$$

$$D_g = (0, +\infty)$$

$$f^{-1}(3) = x \Rightarrow f(x) = 3 \Rightarrow \log_3(\sqrt{x^2-1}) = 3$$

-۳۱

$$(\sqrt{x^2-1}) = 27 \Rightarrow x^2 = 4 \Rightarrow x = \pm 2$$



$$f(t) = 100 \times (3)^t \quad \text{۳۲- الف)}$$

$$f(10) = 100 \times 3^{10} \Rightarrow f(10) = 5904900 \quad \text{ب)}$$

$$f(t) = 24300 = 100 \times (3)^t \Rightarrow 243 = 3^t \Rightarrow 3^5 = 3^t \Rightarrow t = 5 \quad \text{پ)}$$

۳۳- ۱

۳۴- نادرست

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$$\text{Log}_3(x-1)\left(\frac{x}{2}+1\right)=2 \Rightarrow (x-1)\left(\frac{x}{2}+1\right)=9 \Rightarrow x^2+x-20=0 \quad \text{۳۵-}$$

$$x = -5, \quad x = 4 \quad \text{مجموعه جواب} = \{4\}$$

۳۶- $\frac{2}{3}$

۳۷- درست

$$\text{Log}_3(x^2-1) - \text{Log}_3(x+3) = 1 \quad \text{۳۸-}$$

$$\text{Log}_3 \frac{(x^2-1)}{(x+3)} = 1 \Rightarrow \frac{(x^2-1)}{(x+3)} = 3 \Rightarrow x^2-3x-10=0$$

$x = 5, x = -2$ هر دو جواب قابل قبول است.

$$f^{-1}(27) = a \Rightarrow f(a) = 27 \quad \text{۳۹-}$$

$$2^{a+1} - 5 = 27 \Rightarrow 2^{a+1} = 32 = 2^5 \Rightarrow a+1 = 5 \Rightarrow a = 4$$

$$f^{-1}(x) = \text{Log}_7 x \quad \text{۴۰-}$$

۴۱- درست

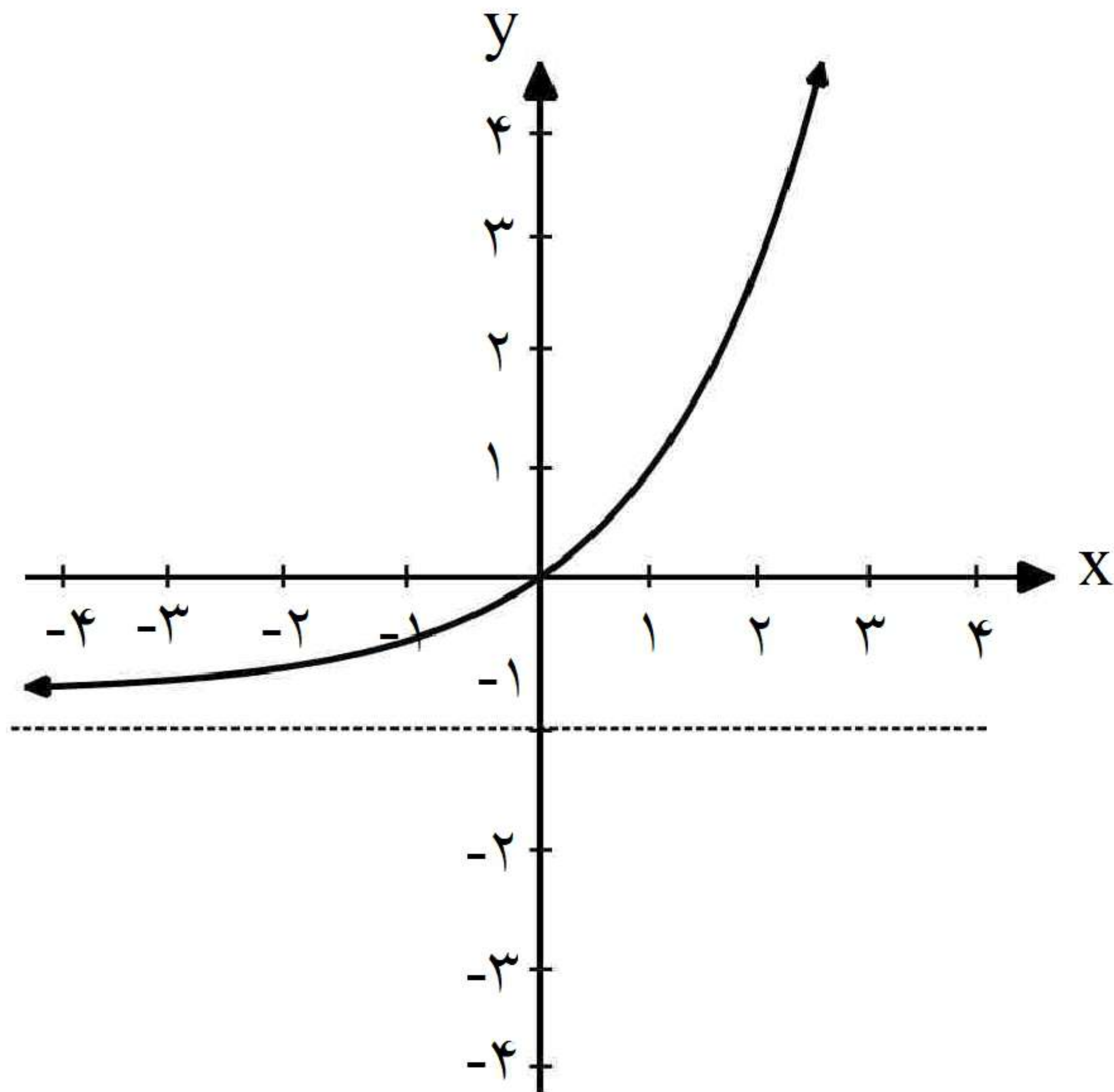


$$\text{Log}_5 (x+6)(x+2) = 1 \Rightarrow (x+6)(x+2) = 5 \Rightarrow x^2 + 8x + 7 = 0$$

-۴۲

$$\begin{cases} x_1 = -1 & \text{ق ق} \\ x_2 = -7 & \text{غ ق ق} \end{cases}$$

$$\text{Log}_{12}^4 + \text{Log}_{12}^{36} = \text{Log}_{12}^{144} = 2$$



$$D_f = (-\infty, +\infty)$$

$$R_f = (-1, +\infty)$$

-۴۳

$$\text{Log}_2^2 \times 3 = 2 \text{Log}_2 2 + \text{Log}_2 3 = 2 \times 0/3 + 0/48 = 1/08$$

-۴۴

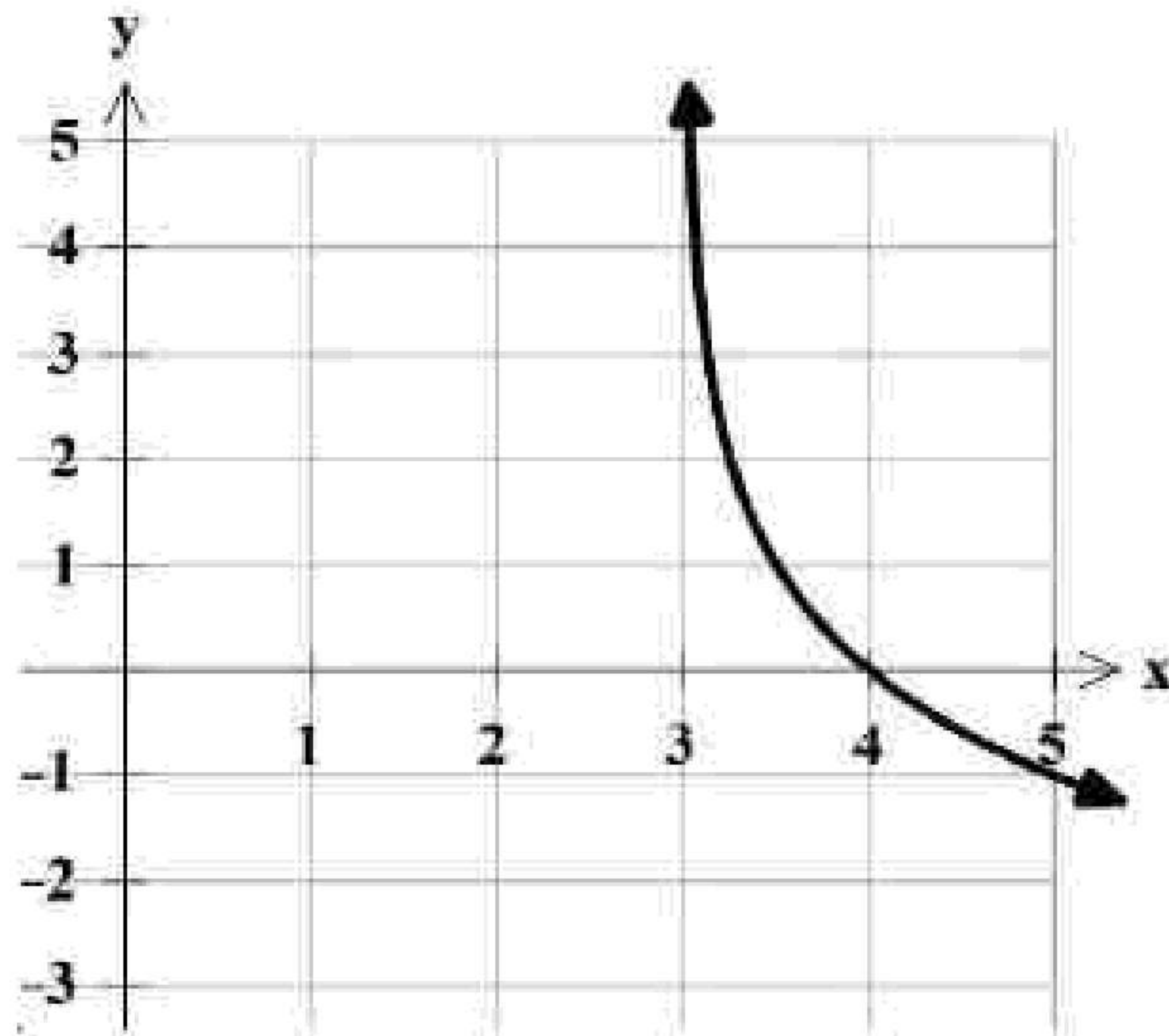
$$\text{الف) } 3^{x-2} = \frac{1}{(3^3)^x} = 3^{-3x} \Rightarrow x-2 = -3x \Rightarrow x = \frac{1}{2}$$

-۴۵

$$\text{ب) } \text{Log}(x+3)x = 1 \Rightarrow (x^2 + 3x) = 10 \Rightarrow x^2 + 3x - 10 = 0 \Rightarrow \begin{cases} x = -5 & \text{غ ق ق} \\ x = 2 & \text{ق ق} \end{cases}$$



۴۶- انتقال ۳ واحد به راست تابع $y = \log_2 x$ و سپس قرینه نسبت به محور x ها



$$\log(x+3) + \log(x-3) - \log x = 3 \log 2 \quad -47$$

$$\log \frac{(x+3)(x-3)}{x} = \log 2^3 \Rightarrow \frac{x^2 - 9}{x} = 8 \Rightarrow x^2 - 8x - 9 = 0$$

$$\begin{cases} x = -1 \\ x = 9 \end{cases}$$

جواب $x = -1$ غیر قابل قبول است.

$$R = (0, +\infty) \quad \text{الف} \quad -48$$

$$f^{-1}(x) = \log_3 x \quad \text{ب)}$$

۴۹- نادرست

$$\log(x-1) + \log\left(\frac{x}{2} + 1\right) = \log 18 - \log 2 \Rightarrow \log x - 1 \left(\frac{x}{2} + 1\right) = \log \frac{18}{2} \quad -50$$

$$\Rightarrow (x-1) \left(\frac{x}{2} + 1\right) = 9 \Rightarrow \frac{x^2}{2} + \frac{x}{2} - 10 = 0 \Rightarrow x^2 + x - 20 = 0 \Rightarrow (x+5)(x-4) = 0$$

$$x = -5 \quad \text{غ ق ق} \quad x = 4$$

۵۱- گزینه ۲ پاسخ صحیح است.

$$\log \sqrt[3]{49^2} = \log \sqrt[3]{7^4} = \frac{4}{3} \log 7 = \frac{4}{3}$$

۵۲- کاهش

