

$$\log_n^{m^2 n} = \log_n^{m^2} + \log_n^n = 2 \log_n^m + 1$$

$$b = 2a + 1 \Rightarrow [b] = [1 + 2a]$$

(الف)

$$x > 0 / x \neq 1 \quad (\log_{\frac{1}{x}} 1 = 0)$$

$$\frac{x}{\log_{\frac{1}{x}} x} \geq 0 \Rightarrow \log_{\frac{1}{x}} x > 0 \Rightarrow 0 < x < 1$$

$$\log_{\frac{1}{x}} x < 0 \Rightarrow x > 1$$

$$D = (0, 1)$$

$$\sqrt{x^2 - 1 + 1} = \sqrt{x^2} = |x|$$

$$x^2 - x - 2 > 0 \Rightarrow (x-2)(x+1) > 0 \Rightarrow \begin{matrix} - & + & - & + \\ + & - & + & - \end{matrix}$$

$$|x| \neq 0 \Rightarrow x \neq 0 \Rightarrow D = (-\infty, -1) \cup (2, +\infty)$$

$$3 \log_a x + \log_a \sqrt{x} = 2 \text{ و } x = 9$$

$$\log_a \sqrt{x} = \frac{1}{2} \log_a x \Rightarrow 3 \log_a x + \frac{1}{2} \log_a x = 2 \Rightarrow \frac{7}{2} \log_a x = 2$$

$$\frac{7}{2} \log_a 9 = 2 \Rightarrow \log_a 9 = \frac{4}{7} \Rightarrow a^{\frac{4}{7}} = 9 \Rightarrow a = 9^{\frac{7}{4}} = 3^{\frac{14}{4}} = 3^{\frac{7}{2}}$$

$$a = 3^{\frac{7}{2}} = \boxed{21\sqrt{3}}$$

$$\log \frac{a}{2} = \log a - \log 2 \text{ و } \log \frac{a}{2} = \log \frac{1}{2} = 1 - \log 2 = 1 - 0.3 = 0.7 \Rightarrow \boxed{0.7}$$

$$\log \frac{a}{2} = 0.7 \Rightarrow 0.7 - 0.3 = 0.4$$

$$\log 9 = \log 3^2 = 2 \log 3 = 2(0.4) = 0.8$$

$$\log 18 = \log 3 \times 6 = \log 3 + \log 6 = 0.4 + 0.7 = 1.1$$

$$\Rightarrow 0.4x^2 + 0.8x - 1.1 = 0 \Rightarrow 4x^2 + 8x - 11 = 0$$

$$|x_1 - x_2| = \frac{\sqrt{b^2 - 4ac}}{|a|} = \frac{\sqrt{4^2 + 44}}{4} = \sqrt{15}$$

$$\log_2 2 = \log_2 2^1 = \log_2 2 - \log_2 1$$

$$\log_2 2 = \frac{1}{\log_2 2} = 2$$

[-5] $\mu\mu$

سنة ١٤٢٢

دي ١٣٩٩

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2021 January 12

$$\log_2 16 = \log_2 2^4 = 4 \log_2 2 = 4 \times 2 = 8$$

$$\log_2 16 = \frac{4}{\log_2 2} = \frac{4}{1} = 4$$

$$\log_2 8 = \frac{\log_2 8}{\log_2 2} = \frac{3}{1} = 3$$

$$\log_2 4 = \frac{\log_2 4}{\log_2 2} = \frac{2}{1} = 2$$

$$\log_2 2 = \log_2 2 + \log_2 1 = \log_2 2 + \frac{1}{4} \log_2 2 = \frac{5}{4} \log_2 2$$

$$\log_2 16 = \log_2 2^4 = 4 \log_2 2 = 4 \times \frac{5}{4} \log_2 2 = 5 \log_2 2$$

$$\log_2 16 = \frac{\log_2 16}{\log_2 16} = \frac{5 \log_2 2}{5 \log_2 2} = \frac{5}{5} = 1$$

$$\frac{1}{2} = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4} = \left(\frac{1}{2}\right)^2 \Rightarrow \left(\frac{1}{2}\right)^{2x-1} = \left(\frac{1}{2}\right)^{2x}$$

[-6]

$$\frac{1}{2} = \left(\frac{1}{2}\right)^{-1} \Rightarrow \left(\frac{1}{2}\right)^{-(2x-1)} = \left(\frac{1}{2}\right)^{2x} \Rightarrow -2x+1 = 2x \Rightarrow x = \frac{1}{4}$$

$$x = \frac{1}{4} \Rightarrow 9\left(\frac{1}{4}\right) + 1 = \frac{9}{4} + 1 = \frac{13}{4} \quad x = -1 \Rightarrow 9(-1) + 1 = -8$$

$$16 = 2^4, 8 = 2^3 \Rightarrow \log_2 16 = \frac{4}{1} = 4$$

$$\log_2 b = \frac{\log_2 b}{\log_2 2} = \frac{1}{2} (1+a) \Rightarrow \log_2 b = \frac{1}{2} (1+a) = \frac{1}{2} + \frac{a}{2}$$

[-7]

$$\Rightarrow a = \log_2 4 \Rightarrow \log_2 b = \frac{1}{2} + \frac{\log_2 4}{2} = \log_2 2 + \log_2 2 = \log_2 4 \Rightarrow b = 4$$

[-8]

$$2b-1 = 2(4)-1 = 8-1 = 7 \Rightarrow \log_2 7 = 2$$

$$\frac{1}{2} = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4} = \left(\frac{1}{2}\right)^2 \Rightarrow \left(\frac{1}{2}\right)^{2x-1} = \left(\frac{1}{2}\right)^{2x}$$

[-9]

$$\left(\frac{1}{\sqrt{2}}\right)^{\frac{1}{2}} = \frac{1}{2}$$