Logarithm

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Instructor, P2A

$2^3 = 8$

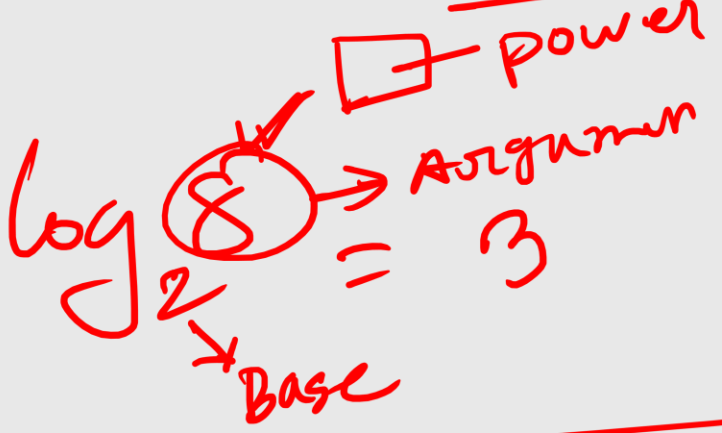
$2 \times 2 \times 2 = 8$

$2^{\square} = 8$

২ কে কতবার গুণ দিলে ৪ পাওয়া যায়?

$\log_2 8 = 3$

$\log_2 8 = \log_2 2^3 \Rightarrow 3 \log_2 2 = 3$



8 এর 2 ভিত্তিক লগ = 3

$$\log_a b = x \rightarrow a^x = b$$

$$a > 0, \quad a \neq 1$$

$$\log_1 8 = x \rightarrow 1^x = 8$$

$$1 = 8$$

$\log_{-2} x = x$

$(-2)^{\frac{1}{2}} = x$

$x = \sqrt{-2}$

$$\log_a 1 = 0$$

$$a^1 = a$$

$$\log_a a = 1$$

$$\log_a (x \times y) = \log_a x + \log_a y$$

$$\log_a \frac{x}{y} = \log_a x - \log_a y$$

$$\log_2 a^3 = \log_2 a \times a \times a$$

$$= \log_2 a + \log_2 a + \log_2 a$$

$$= 3 \log_2 a$$

$\log_2 8 = 3$

$8^{\square} = 2$

$(2^3)^{\frac{1}{3}} = 2$

$\log_8 2 = \frac{1}{3} = \frac{1}{\log_2 8}$

$$\log_a b = \frac{1}{\log_b a}$$

$$\frac{1}{\log_b a} = \log_a b$$

$$\log_8 2 = \div \log_{2^3} 2 = \frac{1}{3} \log_2 2 = \frac{1}{3}$$

$$\log_{b^n} b = \frac{1}{n} \log_a b$$

$$\log_{a^n} b^m = \frac{m}{n} \log_a b$$

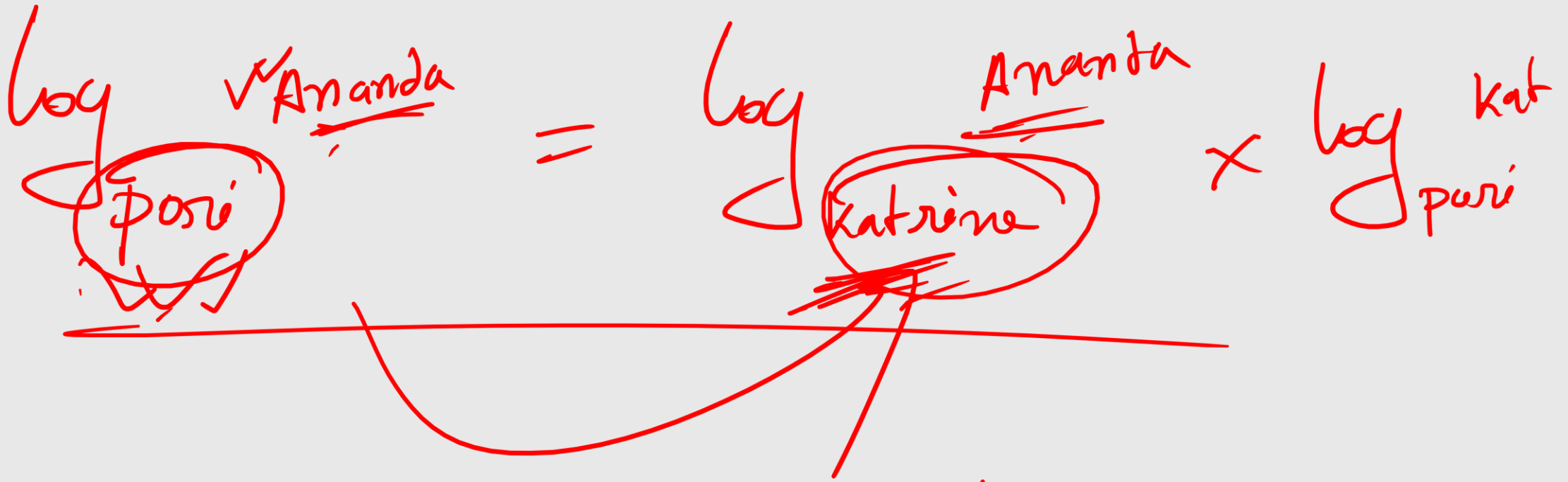
$$\log_4 256 = 4$$

$$\log_4 256 = 4$$

$$\log_2 256 = 8$$

$\log_2 256 = 8$, $\log_4 256 = 4$

$\log_2 256 = \log_4 256 \times \log_2 4$



$$\log_a^b = \log_m^b \times \log_a^m$$

$$\log_a b \times \log_b c \times \log_c a = ?$$

$$\log_a c \times \log_c a = \log_a a$$

$$= 1$$

$$\log_a b = \log_m b \times \log_a m \times \log_m a$$

$$= \log_m b \times \frac{1}{\log_m a}$$

$$= \frac{\log_m b}{\log_m a} = \frac{\log b}{\log a}$$

$$\log_a b = \log_m b \times \log_a m$$

$$\log_a b = \frac{\log b}{\log a}$$

$$\log_a b \times \log_b c \times \log_c a$$

$$= \frac{\log b}{\log a} \times \frac{\log c}{\log b} \times \frac{\log a}{\log c} = 1$$

$\log_{10} 100 = 2$

$10^x = 100$

$\log_a b = b$

a

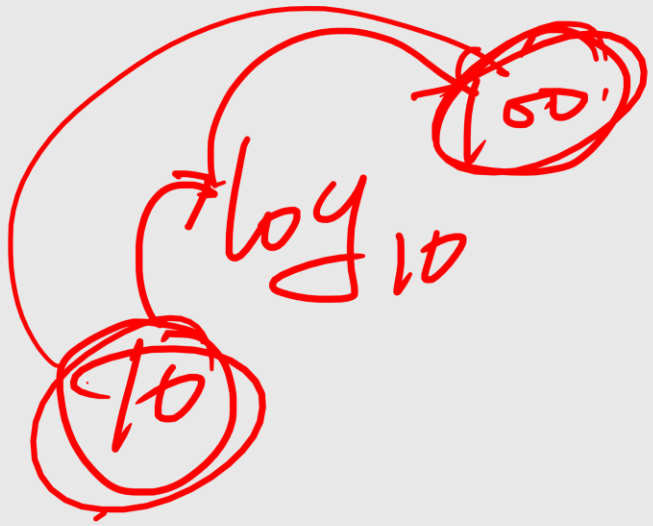
100

$x \log 10$

10

10

$= 100$



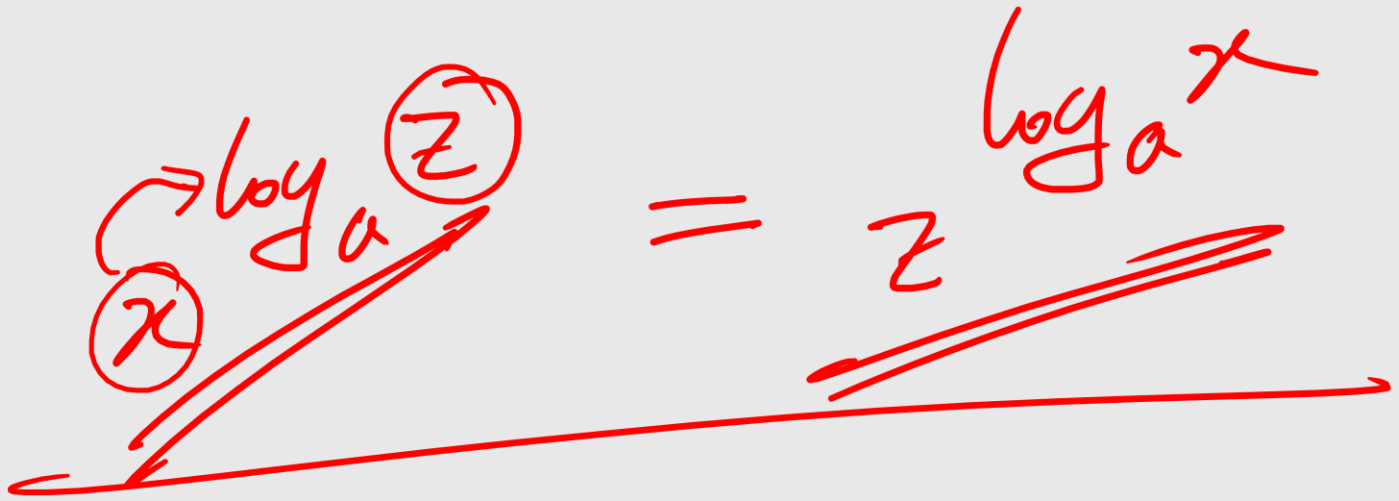
$= 100^{\log_{10} 10}$

$= 100$

$\log_{10} 10$

100

$$a^{\log_a b} = b$$



Formulas

- $\log_a(m \times n) = \log_a m + \log_a n$
- $\log_a\left(\frac{m}{n}\right) = \log_a m - \log_a n$
- $\log_a m^n = n \log_a m$
- $\log_a m = \log_b m \times \log_a b$

Formulas

- $\log_a m = \frac{\log_b m}{\log_b a}$
- $a^{\log_a b} = b$
- $\log_a a = 1$
- $\log_a 1 = 0$

Formulas

- $\log_a b = x$ হলে, $a^x = b$
- $x^{\log_a y} = y^{\log_a x}$
- $\log_{a^n} b^m = \frac{m}{n} \log_a b$

$\log_a 1 = 0$

$a^0 = 1$

$\log_{\sqrt{3}} 81 = ?$ [BKB (Cash)-17]

$= 8$

$\Rightarrow \log_{3^{1/2}} 3^4$

$= \frac{4}{\frac{1}{2}} \log_3 3$

$4 \times 2 = 8$

$3^4 = 81$

$\{(\sqrt{3})^2\}^4 = 81$

$3^8 = 81$

$\log_{\sqrt{2}} 16 = ?$ [Sonali Bank]

$$\frac{\log 36}{\log 6} = ?$$ [BB (Off)-18]

(2)

$$\frac{\log 36}{\log 6}$$

$$= \frac{\log 6^{(2)}}{\log 6} = \frac{2\log 6}{\log 6} = 2$$

$\log_{10} 125 + \log_{10} 8 = ?$

$\log_{10} 125 \times 8 = \log_{10} 1000$

$= 3$

$\log_2 8 \times \log_2 4$

$3 \times 2 = 6$

$8 + 4$

$= \log_2 x$

$\log_{10} 0.0001 = ?$

$\log_{10} 10^{-4} = -4$

youtube

$0.0001 = \frac{1}{10000}$

$= \frac{1}{10^4}$

$= 10^{-4}$

If $\log_x 144 = 4$, then x =? [PKB (Off)-20]

$\log_x 144 = 4$

$x^4 = 144$

$x^4 = 12^2 = (\sqrt{12})^4$

$x = \sqrt{12}$

If $\log_{x^2} \frac{9}{16} = -\frac{1}{2}$, The value of the base is [Comb (SO-IT)-18]

$$\log_{x^2} \frac{9}{16} = -\frac{1}{2}$$

$$(x^2)^{-\frac{1}{2}} = \frac{9}{16}$$

$$x^{-1} = \frac{1}{x} = \frac{9}{16} \Rightarrow x = \frac{16}{9}$$

$$x^2 = \left(\frac{16}{9}\right)^2 = \frac{256}{81}$$

If $\log_x \frac{1}{9} = 2$, The value of the base is [BDBL (SO)-17]

$$\log_x \frac{1}{9} = 2$$

$$x^2 = \frac{1}{9}$$

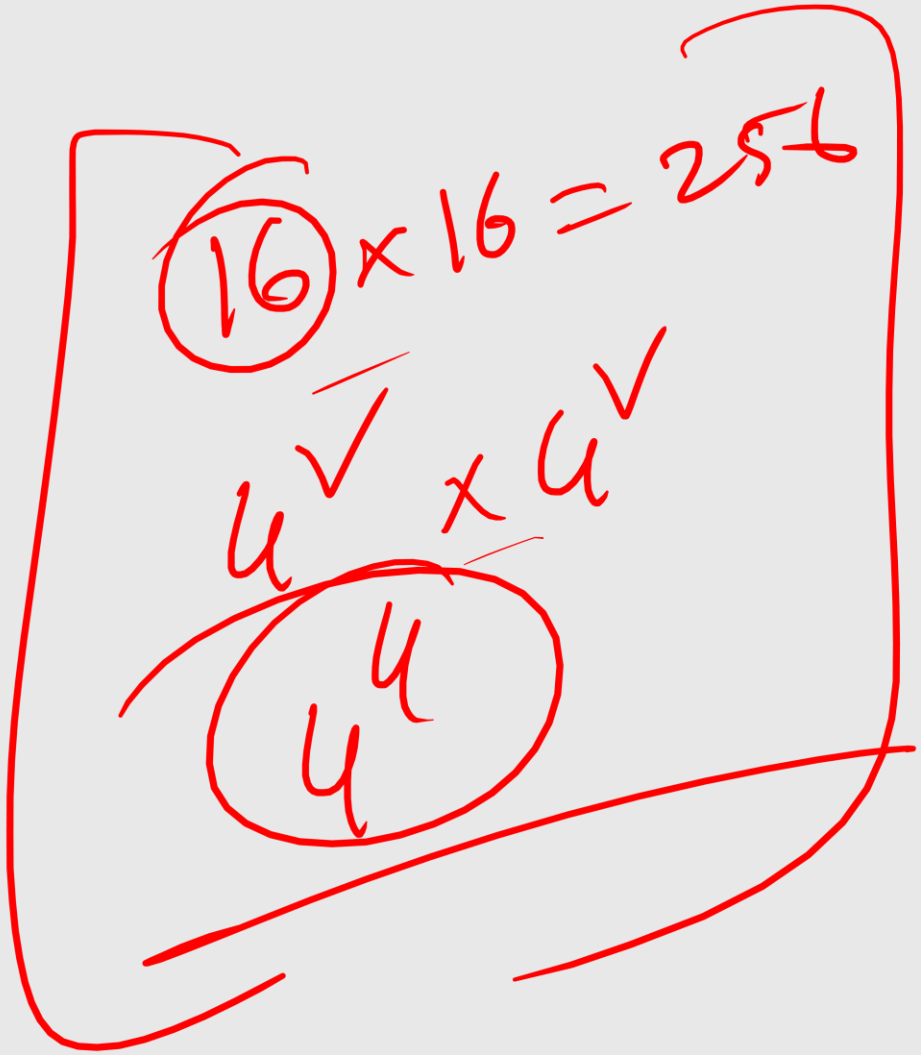
$$x = \sqrt{\frac{1}{9}} = \frac{1}{3}$$

If $\log_x 256 = 4$, then x =? [Comb (SO-FI)-18]

$x^4 = 256$

$x^4 = 4^4$

$x = 4$



If $\log_x 4 = 0.4$, then x =?

$$0.4 = \frac{4}{10} = \frac{2}{5}$$

$$x^{0.4} = 4$$

$$\left[\frac{2}{5} \times \frac{5}{2} \right]$$

$$x^{\frac{2}{5}} = 4$$

$$x = 4^{\frac{5}{2}} = (2^2)^{\frac{5}{2}} = 2^5 = 32$$

Thank You