CATin

READY TO ACE CAT 2026?

Your Complete Self-Study Prep Ecosystem

Exclusive Launch Waitlist Offer:

Join the waitlist today for an exclusive 20% discount on launch! Get priority platform access and all 15 reference sheets delivered directly to your inbox.

JOIN WAITLIST AT CATIN.IN

CAT Logarithms, Surds & Indices Formulas

- "Logarithms, Surds and Indices" is one of the easiest topics in the quantitative section of the CAT exam.
- Although the number of formulas is high, the basic concepts are very simple to understand and apply.
- There are no shortcuts to remember and the scope of the questions that can be asked is very limited.
- The accuracy of answering questions from this section is very high and good students tend to score very well here.

- If X,Y > 0 and m,n are rational numbers then

➔ $X^m \times X^n = X^{m+n}$

➔ $X^0 = 1$

- ➔ $\frac{X^m}{X^n} = X^{m-n}$
- ➔ $\left(X^m\right)^n = X^{mn}$
- ➔ $X^m \times Y^m = (X \times Y)^m$
- ➔ $\frac{X^m}{Y^m} = \left(\frac{X}{Y}\right)^m$
- ➔ $X^{-m} = \frac{1}{X^m}$

- If X and Y are positive real numbers and a,b are rational numbers
  - ➔ $\left(\frac{X}{Y}\right)^{-a} = \left(\frac{Y}{X}\right)^a$
  - ➔ $X^{1/a} = \sqrt[a]{X}$
  - ➔ $X^{a/b} = \sqrt[b]{X^a}$
  - ➔ $\sqrt[a]{X} \times \sqrt[a]{Y} = \sqrt[a]{XY}$

➔ $\frac{\sqrt[a]{X}}{\sqrt[a]{Y}} = \sqrt[a]{\frac{X}{Y}}$

➔ $\frac{1}{\sqrt{N+1}-\sqrt{N}} = \sqrt{N+1} + \sqrt{N}$

- Surds is an irrational number involving a root.

  Ex: $\sqrt{5}, \sqrt[3]{7}, \sqrt[5]{2}$

- Like surds are two surds having the same number under radical sign.
- Like surds can be added or subtracted.

  $6\sqrt{2} + 3\sqrt{2} = 9\sqrt{2}$

- If $a + \sqrt{b} = c + \sqrt{d}$, then a = c and b = d.
- The conjugate of $a + \sqrt{b}$ is $a - \sqrt{b}$
- $\sqrt{a\sqrt{a\sqrt{a.....\infty}}}$ = a

$1-\left[\frac{1}{2^x}\right]$

- To find $\sqrt{x} + \sqrt{y}, \sqrt{x} + \sqrt{y}$ should be written in the form of $m + n + 2\sqrt{mn}$ where $x = m + n$ and $4mn = y$ and $\sqrt{\sqrt{x} + \sqrt{y}} = \pm\left(\sqrt{m} + \sqrt{n}\right)$
- If N = a^x then, x is defined as the logarithm of N to base or $x = log_a N$ a logarithm of a negative number or zero is not defined
- $log_a 1 = 0$
- $log_a xy = log_a x + log_a y$
- $log_a b^c = c\, log_a b$
- $log_a a = 1$
- $X^{log_b y} = Y^{log_b x}$

- $log_a \sqrt[n]{b} = \frac{log_a b}{n}$
- $log_a x = \frac{1}{log_x a}$
- $b^{log_b x} = x$
- $log_a b = \frac{log_c b}{log_c a}$
- $log_a b * log_b a = 1$
- $log_a \left(\frac{X}{Y}\right) = log_a X - log_a Y$
- If 0 < a < 1, then $log_a x < log_a y (if\ x > y)$
- If a > 1 then $log_a x > log_a y$ (if x>y)