Types of Surds.

(1) **Simple surd**: A surd consisting of a single term. For example $2\sqrt{3}, 6\sqrt{5}, \sqrt{5}$ etc.

(2) **Pure and mixed surds:**A surd consisting of wholly of an irrational number is called pure surd.

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

A surd consisting of the product of a rational number and an irrational number is called a mixed surd.

Example: $5\sqrt{3}$.

(3) **Compound surds**: An expression consisting of the sum or difference of two or more surds.

Example: $\sqrt{5}+\sqrt{2},\ 2-\sqrt{3}+3\sqrt{5}$ etc.

(4) **Similar surds**: If the surds are different multiples of the same surd, they are called similar surds.

Example: $\sqrt{45}, \sqrt{80}$ are similar surds because they are equal to $3\sqrt{5}$ and $4\sqrt{5}$ respectively.

(5) **Binomial surds:** A compound surd consisting of two surds is called a binomial surd.

Example: $\sqrt{5}-\sqrt{2}, 3+\sqrt[3]{2}$ etc.

(6) **Binomial quadratic surds:** Binomial surds consisting of pure (or simple) surds of order two *i.e.,* the surds of the form $a\sqrt{b} \pm c\sqrt{d}$ or $a \pm b\sqrt{c}$ are called binomial quadratic surds.

Two binomial quadratic surds which differ only in the sign which connects their terms are said to be conjugate or complementary to each other. The product of a binomial quadratic surd and its conjugate is always rational.

For example: The conjugate of the surd $2\sqrt{7}+5\sqrt{3}$ is the surd $2\sqrt{7}-5\sqrt{3}$.