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In algebra classes, misunderstanding easily leads students to make mistakes in their work when they perform algebraic operations. One of common misunderstanding is that students consider any functions as linear whether they recognize it or not. They tend to use one of properties of linearity of a function, which is $f(a \pm b) = f(a) \pm f(b)$, for polynomial, radical, logarithmic, and rational functions.

(a) polynomial function $f(x) = x^n$

e.g. $(a \pm b)^2 = a^2 \pm b^2$

(b) radical function $\mathrm{f(x)} = \sqrt[n]{x}$

e.g. $\sqrt{a \pm b} = \sqrt{a} \pm \sqrt{b}$

(c) logarithmic function $f(x) = ln\ x$

e.g. $ln\ (a \pm b) = ln\ a \pm ln\ b$

(d) rational function $f(x) = \frac{1}{x}$

e.g. $\frac{1}{b \pm c} = \frac{1}{b} \pm \frac{1}{c}$

When a teacher tries to correct such mistakes, if a student asks (or argues) *why* he or she is wrong with posing an example such as $ln\left(\frac{3}{2} + 3\right) = ln\ \frac{3}{2} + ln\ 3$, or *under which condition*(*s*) the equality can hold, what and how should the teacher explains? For teachers to deal with such situation in their algebra classroom, what should they know?