Rational Functions and Radicals

Problem

Let a and b denote real numbers and n a positive integer. For each statement, determine whether it is always true, sometimes true, or never true.

(1) $\sqrt{a^2} = a$.

(2) $\sqrt[3]{a^3} = a$.

(3) $\sqrt[n]{a^n} = a$.

(4) $\sqrt{a^2 + b^2} = a + b$

(5) $(a + b)^2 = a^2 + b^2$

Answer: The only statement that is always true is (2). Have students discuss values of a, b and n that will make the other statements true. The focus of the question is on common misunderstandings.