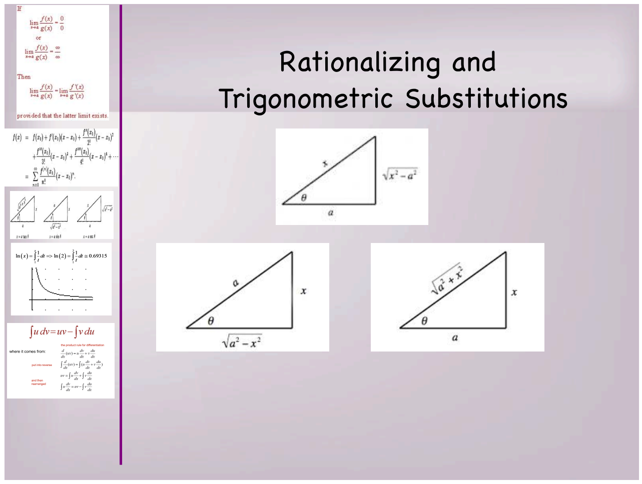

Rationalizing Substitutions

Integrands involving $\sqrt[n]{ax+b}$

EX 1 $\displaystyle\int \frac{x^2+3x}{\sqrt{x+4}}dx$

EX 2 $\displaystyle\int \frac{\sqrt{x}}{x+1}dx$

Integrals involving $\sqrt{a^2-x^2}$, $\sqrt{a^2+x^2}$, $\sqrt{x^2-a^2}$, $a \in \Re$

$$a)\quad \sqrt{a^2-x^2} \rightarrow let\ x = a\sin\theta \qquad \theta \in [-\pi/2, \pi/2]$$
$$b)\quad \sqrt{a^2+x^2} \rightarrow let\ x = a\tan\theta \qquad \theta \in (-\pi/2, \pi/2)$$
$$c)\quad \sqrt{x^2-a^2} \rightarrow let\ x = a\sec\theta \qquad \theta \in [0, \pi],\ \theta \neq \pi/2$$

EX 3 $\displaystyle\int \frac{x^2}{\sqrt{16-x^2}}dx$

EX 4 $\displaystyle\int_2^3 \frac{dt}{t^2\sqrt{t^2-1}}$

Completing the Square (Use this strategy when there is a quadratic expression in the radical.)

EX 5 $\int \frac{3x}{\sqrt{x^2+4x-5}}dx$