

Rules for integrands of the form $(c + d x)^m (a + b \operatorname{Tanh}[e + f x])^n$

N: $\int u^m (a + b \operatorname{Tanh}[v])^n dx$ when $u = c + d x \wedge v = e + f x$

Derivation: Algebraic normalization

Rule: If $u = c + d x \wedge v = e + f x$, then

$$\int u^m (a + b \operatorname{Tanh}[v])^n dx \rightarrow \int (c + d x)^m (a + b \operatorname{Tanh}[e + f x])^n dx$$

Program code:

```
Int[u_^m_.*(a_.+b_.*Tanh[v_])^n_,x_Symbol] :=  
  Int[ExpandToSum[u,x]^m*(a+b*Tanh[ExpandToSum[v,x]])^n,x] /;  
FreeQ[{a,b,m,n},x] && LinearQ[{u,v},x] && Not[LinearMatchQ[{u,v},x]]
```

```
Int[u_^m_.*(a_.+b_.*Coth[v_])^n_,x_Symbol] :=  
  Int[ExpandToSum[u,x]^m*(a+b*Coth[ExpandToSum[v,x]])^n,x] /;  
FreeQ[{a,b,m,n},x] && LinearQ[{u,v},x] && Not[LinearMatchQ[{u,v},x]]
```