Prove:

$$\frac{\sin A}{1+\cos A} = \frac{1-\cos A}{\sin A}$$

Proof:

The Multiplication Properties of Equality:

If you multiply two equality elements by the same element, then the resulting elements are equivalent.

Multiplying both sides by $\frac{\sin A}{1-\cos A}$

LHS: $\frac{\sin A}{1+\cos A} \cdot \frac{\sin A}{1-\cos A} = \frac{\sin^2 A}{1-\cos^2 A}$

The Pythagorean Identities:

$\sin^2 A + \cos^2 A = 1$

So $1 - \cos^2 A = 1$ and so

LHS: $\frac{\sin^2 A}{1-\cos^2 A} = \frac{\sin^2 A}{\sin^2 A} = 1$

RHS: $\frac{1-\cos A}{\sin A} \cdot \frac{\sin A}{1-\cos A} = 1$

Hence

LHS=RHS