Exponential Equations Example

Rewrite both sides with a common base, solve for the exponent, and check by substitution.

Solve: 3^(2x - 1) = 81

If b^u = b^v, where b > 0 and b is not 1, then u = v.

Step-by-step solution

1. Rewrite 81 using base 3

81 = 3^4, so 3^(2x - 1) = 3^4.

2. Equate exponents

2x - 1 = 4.

3. Isolate x

2x = 5; therefore x = 5/2 = 2.5.

Answer

x = 5/2

Check

Substitute: 3^(2(5/2) - 1) = 3^4 = 81.