

Solving Equations with Variable Exponents

$$27^{x+1} = 3^{-x}$$

The key steps are

1. Get the bases on both sides of the equation to be the same

$$27^{x+1} = 3^{-x}$$

$$(3^3)^{x+1} = 3^{-x}$$

$$3^{3x+3} = 3^{-x}$$

2. Make a new equation by setting your exponents equal to each other

$$3x + 3 = -x$$

3. Solve this new equation

$$3x + 3 = -x$$

$$4x = -3$$

$$x = -\frac{3}{4}$$

4. (Optional) You can check your solution by substituting it into the original equation to see if it works