Prove that for all real numbers $x$ not equal to $0, x^0 = 1$

Proof:

Let $x$ be a real number such that $x \neq 0$

Note that $x^{a-a} = x^0$ for all real numbers a. Also note that $x^{a-a} = \frac{x^a}{x^a}$

So $x^0 = \frac{x^a}{x^{a.}}$. Since $x \neq 0$, $x^a \neq 0$

Therefore, since any real number divded by itself is 1, $x^0 = 1$. QED.