

$$f(x) = a^x \implies f^{-1}(x) = \log_a(x)$$
$$(f \circ f^{-1})(x) = f(f^{-1}(x)) = a^{\log_a(x)} = x$$

other way around

$$(f^{-1} \circ f)(x) = \log_a(a^x) = x$$
$$x = a^y$$
$$a^{\log_a(x)} = a^{\log_a(a^y)}$$
$$= a^y = x$$

