

- Switch x and y
- Solve for y

For each of the following, find the inverse.

* $\log_e x = \ln x$ *

<p>1. $f(x) = 3^x$ $x = 3^y$ $\log_3 x = y$</p>	<p>2. $f(x) = 3^x + 4$ $x = 3^y + 4$ $x - 4 = 3^y$ $\log_3 (x - 4) = y$</p>
<p>3. $f(x) = 3^{x-2}$ $x = 3^{y-2}$ $\log_3 x = y - 2$ $y = \log_3 x + 2$</p>	<p>4. $f(x) = 3^{x+3} - 5$ $x = 3^{y+3} - 5$ $x + 5 = 3^{y+3}$ $\log_3 (x + 5) = y + 3$ $\log_3 (x + 5) - 3 = y$</p>
<p>5. $g(x) = \left(\frac{1}{2}\right)^x + 8$ $x = \left(\frac{1}{2}\right)^y + 8$ $x - 8 = \left(\frac{1}{2}\right)^y$ $\log_{\frac{1}{2}} (x - 8) = y$</p>	<p>6. $f(x) = e^{x+3}$ $x = e^{y+3}$ $\log_e x = y + 3$ $\ln x = y + 3$ $y = \ln x - 3$ or $y = \log_e x - 3$</p>
<p>7. $f(x) = e^x - 4$ $x = e^y - 4$ $x + 4 = e^y$ $\log_e (x + 4) = y$ <u>or</u> $\ln (x + 4) = y$</p>	<p>8. $h(x) = e^{x+2} - 3$ $x = e^{y+2} - 3$ $x + 3 = e^{y+2}$ $\log_e (x + 3) = y + 2$ $\ln (x + 3) - 2 = y$ <u>or</u> $y = \log_e (x + 3) - 2$</p>

Find the inverse

1. $y = \log_2 x + 1$

$$x = \log_2 y + 1$$

$$x - 1 = \log_2 y$$

$$\boxed{2^{x-1} = y}$$

2. $y = \log_{\frac{1}{4}}(x+3)$

$$x = \log_{\frac{1}{4}}(y+3)$$

$$\left(\frac{1}{4}\right)^x = y+3$$

$$\boxed{y = \left(\frac{1}{4}\right)^x - 3}$$

3. $y = \log(x-9)$

$$y = \log_{10}(x-9)$$

$$x = \log_{10}(y-9)$$

$$10^x = y-9$$

$$\boxed{y = 10^x + 9}$$