

Solving Equations with e and $\ln x$

We know that the natural log function $\ln(x)$ is defined so that if $\ln(a) = b$ then $e^b = a$. The *common log* function $\log(x)$ has the property that if $\log(c) = d$ then $10^d = c$. It's possible to define a logarithmic function $\log_b(x)$ for any positive base b so that $\log_b(e) = f$ implies $b^f = e$. In practice, we rarely see bases other than 2, 10 and e .

Solve for y :

1. $\ln(y + 1) + \ln(y - 1) = 2x + \ln x$

2. $\log(y + 1) = x^2 + \log(y - 1)$

3. $2 \ln y = \ln(y + 1) + x$

Solve for x (hint: put $u = e^x$, solve first for u):

4. $\frac{e^x + e^{-x}}{e^x - e^{-x}} = y$

5. $y = e^x + e^{-x}$

MIT OpenCourseWare
<http://ocw.mit.edu>

18.01SC Single Variable Calculus
Fall 2010

For information about citing these materials or our Terms of Use, visit: <http://ocw.mit.edu/terms>.