

Algebra II

10-8

The Natural Logarithm

Euler's Number - pronounced Oiler

$e - 2.718281828\dots$

On the calculator -

$$\frac{e^x}{\ln}$$

The Natural Logarithm - $\ln x = \log_e x$

logarithm naturale - logarithm with base e

on the calculator -

e^x
ln

Write each equation in expanded form. (pg 490)

*1) $\ln_e 10 = 2.303$

$$e^{2.303} = 10$$

Write each equation in logarithmic form.

*2) $e^5 = 148.413$

$$\ln 148.413 = 5$$

Simplify.

$$*3) \ln e^7 = 7$$

$$\begin{array}{l} y = e^x \\ y = \ln x \end{array} \text{ } \} \text{-inverses}$$

$$*4) e^{\ln 23} = 23$$

Write as a single logarithm.

$$*5) \ln x + \ln y - 2 \ln z$$

$$\ln \frac{xy}{z^2}$$

Solve. Write answer in terms of e and as a decimal to the nearest thousandth.

$$*6) \ln x = 1.94$$

$$e^{1.94} = x$$
$$\{6.959\}$$

$$*7) e^{4x} = 2.16$$

$$\cancel{\ln e^{4x}} = \ln 2.16$$

$$\frac{4x}{4} = \frac{\ln 2.16}{4}$$

$$x = 0.193$$

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