

GSE PreCalculus: Unit - Natural Logarithms  
Solving Logarithmic Equations with ln and e

Name Key

Date \_\_\_\_\_

Convert natural log to Exponential:

1.  $\ln(x-2) = 4$

$$e^4 = x - 2$$

2.  $\ln 54.6 = 4$

$$e^4 = 54.6$$

3.  $\ln a = z$

$$e^z = a$$

Convert Exponential to natural log

4.  $e^3 = 20.1$

$$\ln 20.1 = 3$$

5.  $e^x = w$

$$\ln w = x$$

6.  $e^t = k$

$$\ln k = t$$

Solve the following logarithmic or exponential functions

7.  $e^x = 45$

$$\ln e^x = \ln 45$$

$$x = 3.81$$

8.  $e^x - 21 = 14$

$$+21 \quad +21$$

$$e^x = 35$$

$$\ln e^x = \ln 35$$

$$x = 3.56$$

9.  $\ln(x+1) = \ln(5x-6)$

$$\begin{array}{r} x+1 = 5x-6 \\ -x+6 \quad -x+6 \end{array}$$

$$\frac{7}{4} = \frac{4x}{4}$$

$$1.75 = x$$

10.  $-4e^x + 21 = -39$

$$-21 \quad -21$$

$$\frac{-4e^x}{-4} = \frac{60}{-4}$$

$$e^x = 15$$

$$\ln e^x = \ln 15$$

$$x = 2.71$$

11.  $\ln 3x = 5$

$$e^{\ln 3x} = e^5$$

$$\frac{3x}{3} = \frac{148.41}{3}$$

$$x = 49.47$$

12.  $\ln(4x-2) = 5$

$$\begin{array}{r} 4x-2 = 148.41 \\ +2 \quad +2 \end{array}$$

$$\frac{4x}{4} = \frac{150.41}{4}$$

$$x = 37.60$$