

HW 4 - Solving Logs Continued

Solve each equation.

1) $\ln(2v-10) = \ln(4v-8)$

$$2v-10 = 4v-8$$

$$-10 = 2v-8$$

$$-2 = 2v$$

$$v = -1$$

*check answer!
makes a negative
log!

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2) $\ln(4x+5) = \ln(2x+4)$

$$4x+5 = 2x+4$$

$$2x = -1$$

$$x = -\frac{1}{2}$$

3) $\ln -m = \ln(4m+5)$

$$-m = 4m+5$$

$$-5m = 5$$

$$m = -1$$

4) $-3 + \ln -3n = -2$

$$\ln -3n = 1$$

$$e^1 = -3n$$

$$\frac{e}{-3} = n$$

$$n = -.9061$$

5) $8 \ln 3x = 16$

$$\ln 3x = 2$$

$$e^2 = 3x$$

$$\frac{e^2}{3} = x$$

$$x = 2.4630$$

6) $-6 \log_4(5x+8) = -18$

$$\log_4(5x+8) = 3$$

$$4^3 = 5x+8$$

$$64 = 5x+8$$

$$56 = 5x$$

$$x = \frac{56}{5}$$

$$x = 11.2$$

7) $-e^{k-10} = -67$

$$e^{k-10} = 67$$

$$\ln 67 = k-10$$

$$\ln(67) + 10 = k$$

$$k = 14.2047$$

8) $e^{9n-3} - 9 = 5$

$$e^{9n-3} = 14$$

$$n = \frac{\ln(14) + 3}{9}$$

$$\ln 14 = 9n-3$$

$$\ln(14) + 3 = 9n$$

$$n = .6266$$

9) $\ln(x-4) - \ln 4 = 5$

$$\ln \frac{x-4}{4} = 5$$

$$e^5 = \frac{x-4}{4}$$

$$4e^5 = x-4$$

$$4e^5 + 4 = x$$

$$x = 597.6526$$

10) $\ln 2x - \ln 9 = \ln 42$

$$\ln \frac{2x}{9} = \ln 42$$

$$\frac{2x}{9} = 42$$

$$2x = 378$$

$$x = 189$$

11) $10e^r = 36$

$e^r = 3.6$

$\ln 3.6 = r$

$r = 1.2809$

12) $-e^a = -14$

$e^a = 14$

$\ln 14 = a$

$a = 2.6391$

Solve each equation.

13) $\log(b-2) = \log(-3b+2)$

$b-2 = -3b+2$

$4b = 4$

~~$b = 1$~~

makes log negative!

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14) $\log_{19}(5p-2) = \log_{19}(-p+4)$

$5p-2 = -p+4$

$6p = 6$

$p = 1$

15) $\log_2(b^2+28) = \log_2(-11b-2)$

$b^2+28 = -11b-2$

$b^2+11b+30 = 0$

$(b+5)(b+6) = 0$

$b = -5$ $b = -6$

16) $-10 \log m = 10$

$\log m = -1$

$10^{-1} = m$

$m = 1/10$

17) $\log_4(x-4) = 2$

$4^2 = x-4$

$16 = x-4$

$20 = x$

18) $15^{7m} = 71$

$\log_{15} 71 = 7m$

$\frac{\log_{15} 71}{7} = m$

$m = .2249$

19) $17^{n+9} = 13$

$\log_{17} 13 = n+9$

$\log_{17} 13 - 9 = n$

$n = -8.0947$

20) $\log 8 - \log(x-5) = 1$

$\log \frac{8}{x-5} = 1$

$10^1 = \frac{8}{x-5}$

$10x-50 = 8$

$10x = 58$
 $x = 5.8$

21) $\log_4 x - \log_4(x-5) = 2$

$\log_4 \frac{x}{x-5} = 2$ $-80 = -15x$

$4^2 = \frac{x}{x-5}$

$16x-80 = x$

$x = 5.3333$

22) $\log_3 x - \log_3(x-6) = 3$

$\log_3 \frac{x}{x-6} = 3$

$3^3 = \frac{x}{x-6}$

$27x-162 = x$

$x = 6.2308$