Practice Problems
6.5 Exponential and Logarithmic Functions

Name: _____ Day
Date: _____ Period: _____

I. Solve the following exponential equations for x. Round to four decimal places if necessary.

1) $3^x = 8$

$\log_3 8 = x$

$\frac{\log 8}{\log 3} = x$

$x = 1.8938$

$3^{x+4} = 3^3$

$x+4 = 3$

$x = -1$

2) $3^{(x+4)} = 27$

$\log_3 27 = x+4$

$\frac{\log 27}{\log 3} = x+4$

$3 = x+4$

$-1 = x$

3) $2^{(x+2)} = 20$

$\log_2 20 = x+2$

$\frac{\log 20}{\log 2} = x+2$

$x \approx 2.3219$

4) $6e^{2x} = 40$

$e^{2x} = \frac{40}{6}$

$\ln\left(\frac{40}{6}\right) = 2x$

$x \approx .9486$

II. Solve the following logarithmic equations for x. Round to four decimal places if necessary.

1) $\log_3(x-5) = 4$

$3^4 = x-5$

$81 = x-5$

$86 = x$

2) $\ln x = 9$

$e^9 = x$

$x \approx 8103.0839$

3) $\log_2(30-x) = 4$

$2^4 = 30-x$

$16 = 30-x$

$-14 = -x$

$14 = x$

4) $\log(x+2) + \log(x-1) = 1$

$\log((x+2)(x-1)) = 1$

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

$10 = x^2+x-2$

$0 = x^2+x-12$

$0 = (x+4)(x-3)$

~~$x = -4$~~

$x = 3$

5) $4 + 2\log_2(3x) = 18$

$2\log_2(3x) = 14$

$\log_2 3x = 7$

$2^7 = 3x$

$128 = 3x$

$\frac{128}{3} = x$

6) $\log_5 x + \log_5(x+1) = \log_5 20$

$\log_5(x(x+1)) = \log_5 20$

$x(x+1) = 20$

$x^2+x = 20$

$x^2+x-20 = 0$

$(x+5)(x-4) = 0$

$x = 4$

~~$x = -5$~~