College Algebra **Name:** Namani

3.5 Day 4 Practice **Date:** _____ **Period:** _____

Solve. If necessary, round to four decimal places. Don't forget to check your answers!

1) $5 \cdot 10^x = 25$

$\frac{5}{5} \quad \frac{25}{5}$

$10^x = 5$

$\log 10^x = \log 5$

$x \quad \frac{\log 10}{\log 10} = \frac{\log 5}{\log 10}$

$x = 0.6990$

2) $\log_5 12 = 3x$

$\frac{1.5440}{3} = \frac{3x}{3}$

$0.5147 = x$

3) $e^{x-3} - 8 = 10$

$e^{x-3} = 18$

$\ln e^{x-3} = \ln 18$

$x - 3 = \ln 18$

$x - 3 = 2.8904$

$x = 5.8904$

4) $2^{(5x^2+3x-10)} = 16^{2x}$

$2^{5x^2+3x-10} = 2^{4(2x)}$

$5x^2 + 3x - 10 = 8x$

$5x^2 - 5x - 10 = 0$

$\frac{5}{5} \quad \frac{5}{5} \quad \frac{5}{5}$

$x^2 - x - 2 = 0$

$(x-2)(x+1) = 0$

$x = +2, -1$

$\log 2^{5x^2+3x-10} = \log 16^{2x}$

$(5x^2+3x-10)\log 2 = (2x)\frac{\log 16}{\log 2}$

$(5x^2+3x-10)\frac{\log 2}{\log 2} = (2x)(4)$

$5x^2 + 3x - 10 = 8x$

$5x^2 - 5x - 10 = 0$

5) $-6e^{8x+8} - 3 = -23$

$\frac{-6e^{8x+8}}{-6} = \frac{-20}{-6}$

$e^{8x+8} = 3.3333$

$\ln e^{8x+8} = \ln 3.3333$

$8x + 8 = 1.2040$

$8x = -6.7960$

$x = -.8495$

6) $5 \cdot 18^{6x} = 26$

$\frac{5}{5} \quad \frac{26}{5}$

$18^{6x} = 5.2$

$\log 18^{6x} = \log 5.2$

$6x \quad \frac{\log 18}{\log 18} = \frac{\log 5.2}{\log 18}$

$6x = .5704$

$x = .0951$

7) $\log_2\left(\frac{x+1}{x}\right)=5$

$\frac{x+1}{x} = 2^5$

$x \cdot \frac{x+1}{x} = 32 \cdot x$

$x+1 = 32x$

$1 = 31x$

$\boxed{\frac{1}{31} = x}$

8) $3^{2x} = 80$

$\log 3^{2x} = \log 80$

$2x\,(\log 3) = \log 80$

$\frac{2x\,(\log 3)}{\log 3} = \frac{\log 80}{\log 3}$

$2x = 3.9887$

$\boxed{x = 1.9944}$

9) $\log_2(x+2)+\log_2(x)=3$

$\log_2 (x+2)(x) = 3$

$(x+2)(x) = 2^3$

$x^2+2x = 8$

$x^2+2x-8=0$

$(x+4)(x-2)=0$

$x = -4, \boxed{2}$

10) $8^{x^2-2x} = \left(\frac{1}{32}\right)^{-2x+1}$

$2^{3(x^2-2x)} = 2^{-5(-2x+1)}$

$3x^2-6x = 10x-5$

$3x^2-16x+5=0$

$(3x-1)(x-5)=0$

$\boxed{x = 1/3, 5}$

11) $\log(x^2-x+80)=2$

10

$x^2-x+80 = 10^2$

$x^2-x+80 = 100$

$x^2-x-20=0$

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

$\boxed{x = 5, -4}$

12) $5\ln(x-4)-12=6$

$\frac{5\ln(x-4)}{5} = \frac{18}{5}$

$\ln_e (x-4) = 3.6$

$x-4 = e^{3.6}$

$x-4 = 36.5982$

$\boxed{x = 40.5982}$