

College Algebra

3.5 Day 3 Practice

Name: _____

Date: _____ Period: _____

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

1) $20^{-6x} + 6 = 55$

$$20^{-6x} = 49$$

$$\log 20^{-6x} = \log 49$$

$$\frac{(-6x) \log 20}{\log 20} = \frac{\log 49}{\log 20}$$

$$-6x = 1.2991$$

$$x = -.2165$$

3) $6e^{5x-6} - 4 = 50$

$$6e^{5x-6} = 54$$

$$e^{5x-6} = 9$$

$$\ln e^{5x-6} = \ln 9$$

$$5x-6 = \ln 9$$

$$5x-6 = 2.1972$$

$$5x = 8.1972$$

$$x = 1.6394$$

5) $\log_2 2x = -0.65$

$$2x = 2^{-.65}$$

$$2x = .6373$$

$$x = .3187$$

2) $\log_4 x + \log_4(10-x) = 2$

$$\log_4 x(10-x) = 2$$

$$x(10-x) = 4^2$$

$$10x - x^2 = 16$$

$$0 = x^2 - 10x + 16$$

$$0 = (x-8)(x-2)$$

$$x = 8, 2$$

4) $\frac{1}{3} \log_2 x + 5 = 7$

$$\frac{1}{3} \log_2 x = 2$$

$$\log_2 x = 6$$

$$x = 2^6$$

$$x = 64$$

6) $2 \cdot 9^{x+10} + 3 = 81$

$$2 \cdot 9^{x+10} = 78$$

$$9^{x+10} = 39$$

$$\log 9^{x+10} = \log 39$$

$$x+10 = \frac{\log 39}{\log 9}$$

$$x+10 = 1.667$$

$$x = -8.3326$$

$$7) \quad \ln 36 = \ln(x-1) - \ln(x+1)$$

$$\ln 36 = \ln \frac{x-1}{x+1}$$

$$36 = \frac{x-1}{x+1}$$

$$36(x+1) = x-1$$

$$36x + 36 = x - 1$$

$$35x = -37$$

$$x = -37/35$$

$$9) \quad \log_{81} 27 = x - 5$$

put in calc

$$7.5 = x - 5$$

$$5.75 = x$$

$$11) \quad 4 \log_5(x+1) = 4.8$$

$$\log_5(x+1) = 1.2$$

$$x+1 = 5^{1.2}$$

$$x+1 = 6.8986$$

$$x = 5.8986$$

$$8) \quad \log 5x + \log(x-1) = 2$$

$$\log 5x(x-1) = 2$$

$$5x(x-1) = 10^2$$

$$5x^2 - 5x = 100$$

$$x^2 - x = 20$$

$$x^2 - x - 20 = 0$$

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

$$x = 5 \quad \text{doesn't work!}$$

$$10) \quad 2 \log x + 5 \log 2 = 9$$

$$\log x^2 (2^5) = 9$$

$$\log 32x^2 = 9$$

$$32x^2 = 10^9$$

$$32x^2 = \frac{1000000000}{32}$$

$$\sqrt{x^2} = \sqrt{31250000}$$

$$x = \pm 5590.1699$$

$$12) \quad \log_7(x^2+2) - \log_7 343 = \log_7 1$$

$$\log_7(x^2+2) - 3 = 0$$

$$\log_7(x^2+2) = 3$$

$$(x^2+2) = 7^3$$

$$x^2+2 = 343$$

$$\sqrt{x^2} = \sqrt{341}$$

$$x = \pm 18.4662$$