

College Algebra  
3.5 Day 1 Practice

Name: Key  
Date: \_\_\_\_\_ Period: \_\_\_\_\_

Solve. Don't forget to check your answers!

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

$$2x+1 = 3x-2$$

$$\boxed{3 = x}$$

2.)  $\log(x^2 - 2) = \log 23$

$$x^2 - 2 = 23$$

$$x^2 = 25$$

$$\boxed{x = \pm 5}$$

$$\left. \begin{aligned} x^2 - 25 &= 0 \\ (x-5)(x+5) &= 0 \end{aligned} \right\}$$

$$\boxed{x = 5} \quad \boxed{x = -5}$$

3.)  $\left(\frac{1}{3}\right)^{\frac{x}{5}} = \left(\frac{1}{3}\right)^2$

$$\frac{x}{5} = 2$$

$$\boxed{x = 10}$$

4.)  $\log x + \log(x - 4) = \log 12$

$$\log x(x-4) = \log 12$$

$$x^2 - 4x = 12$$

$$x^2 - 4x - 12 = 0$$

$$(x-6)(x+2) = 0$$

$$\boxed{x = 6} \quad x = -2$$

5.)  $\log_4[(x-3)(x-2)] = \log_4(2x+36)$

$$x^2 - 5x + 6 = 2x + 36$$

$$x^2 - 7x - 30 = 0$$

$$(x-10)(x+3) = 0$$

$$\boxed{x = 10} \quad x = -3$$

6.)  $7^{2x^2-1} = 7^{x+2}$

$$2x^2 - 1 = x + 2$$

$$2x^2 - x - 3 = 0$$

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

$$x(2x-3) \quad 1(2x-3)$$

$$(x+1)(2x-3) = 0$$

$$\boxed{x = -1} \quad \boxed{x = 3/2}$$

$$\begin{array}{r} -6 \\ -3 \times 2 \\ -1 \end{array}$$

7.)  $\ln(x - 6) = \ln(2x + 1)$

$$x - 6 = 2x + 1$$

$$\cancel{-7 = x}$$

$\emptyset$   
no solutions

8.)  $5^{-2x} = 5^{3x-9}$

$$-2x = 3x - 9$$

$$-5x = -9$$

$$x = \frac{9}{5}$$
$$x = 1.8$$

9.)  $6^{3x} = 6^{6x-4}$

$$3x = 6x - 4$$

$$-3x = -4$$

$$x = \frac{4}{3}$$
$$1.3333$$

10.)  $\log_8(x - 1) = \log_8(x - 2) - \log_8(x + 2)$

$$\log_8(x - 1) = \log_8 \frac{(x - 2)}{(x + 2)}$$

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

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

$$x^2 + x - 2 = x - 2$$

$$x^2 = 0$$

$$\cancel{x = 0}$$

$\emptyset$  no solutions

11.)  $e^{x^2-3} = e^{4x+2}$

$$x^2 - 3 = 4x + 2$$

$$x^2 - 4x - 5 = 0$$

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

$$x = 5 \quad x = -1$$

12.)  $\log_7(x + 5) + \log_7(x + 1) = \log_7(x - 1)$

$$\log_7(x + 5)(x + 1) = \log_7(x - 1)$$

$$x^2 + 6x + 5 = x - 1$$

$$x^2 + 5x + 6 = 0$$

$$(x + 3)(x + 2) = 0$$

$$\cancel{x = -3} \quad \cancel{x = -2}$$

$\emptyset$  no solutions