Algebra 1
Day 10: Solving Exponential Equations
Practice Assignment

Practice

Name: _____

Block: _____

Solve the equation (hint: use your table of exponents).

1. $5^{3-2x} = 5^{-x}$

$3-2x=-x$
$+2x \quad +2x$
$\boxed{3=x}$

2. $2^{2m+2} = 2^{3m}$

$2m+2=3m$
$-2m \quad -2m$
$\boxed{2=m}$

3. $64^{2b} = 8$

$8^{2(2b)} = 8^1$
$2(2b)=1$
$4b=1$
$\boxed{b=1/4}$

4. $3^{2a} = 3^{-a}$

$2a=-a$
$+a \quad +a$
$3a=0$
$\boxed{a=0}$

5. $6^{-2p} = 6^{2-3p}$

$-2p=2-3p$
$+3p \quad +3p$
$\boxed{p=2}$

6. $3^{x-2} = 81$

$3^{x-2}=3^4$
$x-2=4$
$+2 \quad +2$
$\boxed{x=6}$

7. $4^{-x} = 64$

$4^{-x}=4^3$
$-x=3$
$-1 \quad -1$
$\boxed{x=-3}$

8. $100^{4-x} = 10^{x-1}$

$10^{2(4-x)}=10^{x-1}$
$2(4-x)=x-1$
$8-2x=x-1$
$+1 \quad +2x \quad +2x+1$
$9=3x$
$\boxed{x=3}$

9. $9^{2y-1} = 27^{y}$

$3^{2(2y-1)}=3^{3y}$
$2(2y-1)=3y$
$4y-2=3y$
$-4y \quad -4y$
$-2=-y$
$-1 \quad -1$
$\boxed{y=2}$

10. $3^{m+1} = 9^{m-2}$

$3^{m+1}=3^{2(m-2)}$
$m+1=2(m-2)$
$m+1=2m-4$
$-m+4 \quad -m+4$
$\boxed{5=m}$

11. $5^{5x} = 125^{x+2}$

$5^{5x}=5^{3(x+2)}$
$5x=3(x+2)$
$5x=3x+6$
$-3x \quad -3x$
$\frac{2x}{2}=\frac{6}{2}$
$\boxed{x=3}$

12. $4^{3x-6} = 8^{x+3}$

$2^{2(3x-6)}=2^{3(x+3)}$
$2(3x-6)=3(x+3)$
$6x-12=3x+9$
$-3x \quad +12 \quad -3x \quad +12$
$\frac{3x}{3}=\frac{21}{3}$
$\boxed{x=7}$

13. $9^{2x-5} = 27$

$3^{2(2x-5)}=3^3$
$2(2x-5)=3$
$4x-10=3$
$+10 \quad +10$
$4x=13$
$\boxed{x=\frac{13}{4}}$

14. $36^{x} = 6^{x^2-3}$

$6^{2x}=6^{x^2-3}$
$2x=x^2-3$
$-2x \quad -2x$
$0=x^2-2x-3$
$0=(x-3)(x+1)$
$\boxed{x=3 \text{ or } -1}$

15. $2^{x^2+1} = 32$

$2^{x^2+1}=2^5$
$x^2+1=5$
$-5 \quad -5$
$x^2-4=0$
$(x+2)(x-2)=0$
$\boxed{x=-2 \text{ or } 2}$