Algebra 2

Name Key

Exponential Equations

Date _____ Hour ____

Solve each equation.

1) $6^{-2p-1} = \frac{1}{6}$

$6^{-2p-1} = 6^{-1}$

$-2p-1 = -1$

$-2p = 0$

$\boxed{p = 0}$

2) $4^{-2n} = 4^3$

$-2n = 3$

$\boxed{n = -\frac{3}{2}}$

3) $4^{2x} = 64$

$4^{2x} = 4^3$

$2x = 3$

$\boxed{x = \frac{3}{2}}$

4) $3^{2v} \cdot 3^{v+3} = 9$

$3^{2v+v+3} = 3^2$

$3v+3 = 2$

$3v = -1$

$\boxed{v = -\frac{1}{3}}$

5) $\frac{2^3}{2^{3n}} = 2^{3n}$

$2^{3-3n} = 2^{3n}$

$3-3n = 3n$

$3 = 6n$

$\boxed{n = \frac{1}{2}}$

6) $2^{n-2} = 2^{2n}$

$n-2 = 2n$

$-2 = n$

$\boxed{n = -2}$

7) $3^{-m-2} \cdot 3^{-3m} = \frac{1}{3}$

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

$-4m-2 = -1$

$-4m = 1$

$\boxed{m = -\frac{1}{4}}$

8) $\frac{4^3}{4^{-2x+2}} = \frac{1}{64}$

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

$3+2x-2 = -3$

$2x+1 = -3$

$2x = -4$

$\boxed{x = -2}$

9) $81^{x+1} = 27$

$3^{4(x+1)} = 3^3$

$4x+4 = 3$

$4x = -1$

$\boxed{x = -\frac{1}{4}}$

10) $8^x = 32$

$2^{3x} = 2^5$

$3x = 5$

$\boxed{x = \frac{5}{3}}$

11) $25^{-2n} = \frac{1}{5}$

$5^{2(-2n)} = 5^{-1}$

$-4n = -1$

$n = \frac{1}{4}$

12) $\left(\frac{1}{27}\right)^{2n-2} = 81$

$3^{-3(2n-2)} = 3^4$

$-6n+6 = 4$

$-6n = -2$

$n = \frac{1}{3}$

13) $32^{3n} = 4$

$2^{5(3n)} = 2^2$

$15n = 2$

$n = \frac{2}{15}$

14) $81^{p-3} = 9^{2p+2}$

$3^{4(p-3)} = 3^{2(2p+2)}$

$4p - 12 = 4p + 4$

$-12 = 4$

No Solution

15) $2^{-3n} = 8$

$2^{-3n} = 2^3$

$-3n = 3$

$n = -1$

16) $6^{3b} = 6^2$

$3b = 2$

$b = \frac{2}{3}$

17) $6^{-2x-1} = 6^{-2x}$

$-2x - 1 = -2x$

$-1 = 0$

No Solution

18) $7^{-p} = 7^{2p}$

$-p = 2p$

$0 = 3p$

$p = 0$

19) $9^{3x} = 27$

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

$6x = 3$

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

20) $64^{-2n} = 8^n$

$2^{6(-2n)} = 2^{3n}$

$-12n = 3n$

$-15n = 0$

$n = 0$