

Name : _____

Score : _____

Teacher : _____

Date : _____

Exponential Equations Not Requiring Logarithms

Solve each given equation.

1) $9^{w+1} = 729$
 $9^{w+1} = 9^3$
 $w+1=3$
 $w=2$

2) $2^{3x+1} = 2^{4x}$
 $3x+1=4x$
 $1=x$
 $x=1$

3) $7^b \cdot 7^{3b} = 49$
 $7^{b+3b} = 7^2$
 $4b=2$
 $b=1/2$

4) $5^{-3x-3} \cdot 5^{-4x} = 5^{-4x}$
 $5^{-7x-3} = 5^{-4x}$
 $-7x-3=-4x$
 $-3=3x$
 $x=-1$

5) $5^{-2p} \cdot 5^{-3p} = \frac{1}{125}$
 $5^{-2p-3p} = 5^{-3}$
 $-5p=-3$
 $p=3/5$

6) $4^{d-1} \cdot 64 = 4^{3d}$
 $4^{d-1} \cdot 4^3 = 4^{3d}$
 $d-1+3=3d$
 $d+2=3d$
 $2=2d$
 $d=1$

7) $1000^{2n+1} \cdot 10^n = 1000$
 $(10^3)^{2n+1} \cdot 10^n = 10^3$
 $3(2n+1) + n = 3$
 $6n + 3 + n = 3$
 $7n = 0$
 $n=0$

8) $\frac{2^{3r}}{2^{-4r+1}} = 2^{4r}$
 $3r - (-4r+1) = 4r$
 $3r + 4r - 1 = 4r$
 $3r = 1$
 $r = 1/3$

9) $\left(\frac{1}{4}\right)^{-3s+2} \cdot 16^{-4s} = \frac{1}{2}$
 $(2^{-2})^{-3s+2} \cdot (2^4)^{-4s} = 2^{-1}$
 $6s - 4 - 16s = -1$
 $-10s = 3$
 $s = -3/10$

10) $5^{2m-1} = 125$
 $5^{2m-1} = 5^3$
 $2m-1=3$
 $m=2$

11) $8^{-2g-2} = 8^{-4g}$
 $-2g-2=-4g$
 $-2=-2g$
 $1=g$

12) $4^{-3y} \cdot 4^{4y} = 64 \leftarrow 4^3$
 $-3y+4y=3$
 $y=3$

13) $7^{2z-2} \cdot 7^{-3z} = 7^{4z}$
 $2z-2-3z=4z$
 $-z-2=4z$
 $-2=5z$
 $z=-2/5$

14) $10^q \cdot 10^{-4q} = \frac{1}{1000} \leftarrow 10^{-3}$
 $q-4q=-3$
 $-3q=-3$
 $q=1$

