

Solving Exponential Equations Practice #1

Solve each equation.

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

$2^{2m-3} = 2^0$

$2m-3=0$
 $2m=3$ $m = 3/2$

3) $64^{-3n} = 16$

$4^{-9n} = 4^2$

$-9n = 2$
 $n = -2/9$

5) $243^{3p} \cdot \left(\frac{1}{243}\right)^{2-3p} = 9$

$3^{15p} \cdot 3^{-5(2-3p)} = 3^2$

$15p + 15p - 10 = 2$

$30p = 12$
 $p = 2/5$

2) $8^{3v} = 4^{2v}$

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

$9v = 4v$
 $5v = 0$ $v = 0$

4) $\frac{81^{3n}}{9^{-2n}} = 243$

$\frac{9^{6n}}{9^{-2n}} = 243$

$9^{8n} = 243 \rightarrow 3^{16n} = 3^5$
 $16n = 5$

$n = 5/16$

6) $36^{2m} \cdot 36 = 216$

$36^{2m} = 6$

$6^{4m} = 6^1$

$4m = 1$ $m = 1/4$

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Solve each equation.

1) $4^{-3x} = 16$

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

$-3x = 2$
 $x = -2/3$

3) $16^{2a+3} = 64^{-2a}$

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

$4a + 6 = -6a$
 $10a = -6$ $a = -3/5$

5) $625^{-2p} \cdot \frac{1}{125} = 125^{p-1}$

$5^{-8p} \cdot 5^{-3} = 5^{3p-3}$

$-8p - 3 = 3p - 3$
 $0 = 11p$ $p = 0$

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

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

$9x - 6 = 6x + 2$
 $3x = 8$ $x = 8/3$

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

$2^{-1} \cdot 2^{6x} = 2^{-9x}$

$2^{-1+6x} = 2^{-9x}$

$-1 + 6x = -9x$
 $-1 = -15x$

$\frac{1}{15} = x$

6) $125^x \cdot 625^{x-2} = 25$

$5^{3x} \cdot 5^{4x-8} = 5^2$

$3x + 4x - 8 = 2$

$7x = 10$
 $x = 10/7$