U3D2 Practice KEY

Monday, February 1, 2021 10:28 AM

U3D2 Practice

Unit 3 Day 2 Practice

Solving Exponential Equations Without Logarithms

13) $4^{-2x} \cdot 4^{x} = 64$

$4^{-2x+x} = 64$

$4^{-x} = 64$

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

$\frac{-x}{-1} = \frac{3}{-1}$ $x = -3$

14) $6^{-2x} \cdot 6^{-x} = \frac{1}{216}$

$6^{-2x+-x} = \frac{1}{216}$

$6^{-3x} = \frac{1}{6^{3}}$

$6^{-3x} = 6^{-3}$

$\frac{-3x}{-3} = \frac{-3}{-3}$ $x = 1$

15) $2^{x} \cdot \frac{1}{32} = 32$

$2^{x} \cdot \frac{1}{2^{5}} = 2^{5}$

$2^{x} \cdot 2^{-5} = 2^{5}$

$2^{x-5} = 2^{5}$ → $x - 5 = 5$, $+5 \quad +5$

$x = 10$

16) $2^{-3p} \cdot 2^{2p} = 2^{2p}$

$2^{-3p+2p} = 2^{2p}$

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

$-p = 2p$, $+p \quad +p$ → $\frac{0}{3} = \frac{3p}{3}$

$p = 0$

17) $64 \cdot 16^{-3x} = 16^{3x-2}$

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

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

$3 - 6x = 2(3x-2)$

$3 - 6x = 6x - 4$, $+6x \quad +6x$

$3 = 12x - 4$, $+4 \quad +4$ → $\frac{7}{12} = \frac{12x}{12}$

$\frac{7}{12} = x$

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

$81^{3n+2} 243^{n} = 3^{4}$

$(3^{4})^{3n+2} (3^{5})^{n} = 3^{4}$

$4(3n+2) + 5n = 4$

$12n + 8 + 5n = 4$

$17n + 8 = 4$, $-8 \quad -8$ → $\frac{17n}{17} = \frac{-4}{17}$

$n = \frac{-4}{17}$

19) $81 \cdot 9^{-2b-2} = 27$

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

$4 + 2(-2b-2) = 3$

$4 - 4b - 4 = 3$

$\frac{-4b}{-4} = \frac{3}{-4}$

$b = -3/4$

20) $9^{-3x} \cdot 9^{x} = 27$

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

$-6x + 2x = 3$

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

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