Intro to Logarithms

Directions: Answer questions #1-16 on the front, and questions #1-11 odd on the back.

Write each equation in logarithmic form.

1. $9^2 = 81$

$\log_9 81 = 2$

2. $\frac{1}{64} = \left(\frac{1}{4}\right)^3$

$\log_{\frac{1}{4}} \frac{1}{64} = 3$

3. $8^3 = 512$

$\log_8 512 = 3$

4. $\left(\frac{1}{3}\right)^{-2} = 9$

$\log_{\frac{1}{3}} 9 = -2$

5. $2^9 = 512$

$\log_2 512 = 9$

6. $4^5 = 1024$

$\log_4 1024 = 5$

7. $5^4 = 625$

$\log_5 625 = 4$

8. $10^{23} = 0.001$

$\log 0.001 = 23$

Evaluate each logarithm.

9. $\log_2 128 = \boxed{7}$

b/c $2^7 = 128$

10. $\log_4 32 = \boxed{2.5}$

11. $\log_9 (27) = \boxed{1.5}$

12. $\log_2 (-32)$

$\boxed{\text{no sol.}}$

$\emptyset$

13. $\log_{\frac{1}{3}} \frac{1}{9} = \boxed{2}$

14. $\log_{10} 100{,}000 = \boxed{5}$

b/c $10^5 = 100{,}000$

15. $\log_7 7^6 = \boxed{6}$

16. $\log_3 \frac{1}{81} = \boxed{-4}$

b/c $3^4 = 81$

$\boxed{3^{-4}} = \frac{1}{81}$

$\frac{1}{3^4} = \frac{1}{81}$

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Logarithmic Equations

Solve each equation.

1) $\log 5x = \log (2x + 9)$

$$\boxed{x = 3}$$

2) $\log (10 - 4x) = \log (10 - 3x)$

3) $\log (4p - 2) = \log (-5p + 5)$

$$\boxed{p = 7/9}$$

4) $\log (4k - 5) = \log (2k - 1)$

5) $\log (-2a + 9) = \log (7 - 4a)$

$$\boxed{a = -1}$$

6) $2\log_7 -2r = 0$

7) $-10 + \log_3 (n + 3) = -10$

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

8) $-2\log_5 7x = 2$

9) $\log(-m) + 2 = 4$

$$\boxed{m = -100}$$

10) $-6\log_3 (x - 3) = -24$

11) $\log_{12} (v^2 + 35) = \log_{12} (-12v - 1)$

$$\boxed{v = -9} \quad \boxed{v = -4}$$

12) $\log_9 (-11x + 2) = \log_9 (x^2 + 30)$