

(No calc!) Rewrite each logarithmic equation in exponential form. Then solve for x .

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|------------------------------|--|--|---|
| 1. $\log_3 \frac{1}{81} = x$ | 2. $\log_x \sqrt[4]{12} = \frac{1}{4}$ | 3. $x = \log_4 32$ | 4. $\log x = 1$ |
| 5. $3 = \log_x 125$ | 6. $\log_{20} x = 1$ | 7. $\log_{\frac{2}{5}} \frac{25}{4} = x$ | 8. $-\frac{5}{3} = \log_x \frac{1024}{243}$ |

(No calc!) Find the exact value of each logarithm. Write your answer as an integer or a simplified fraction.

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|----------------|--------------------------|---------------------------------------|--------------------------------------|
| 9. $\log_3 81$ | 10. $\log_5 \sqrt{5}$ | 11. $\log_3 \frac{1}{3}$ | 12. $\log_2 \frac{1}{32}$ |
| 13. $\log_8 4$ | 14. $\log 1,000,000,000$ | 15. $\log_{\frac{1}{2}} \frac{1}{32}$ | 16. $\log_{\frac{9}{4}} \frac{2}{3}$ |

(With calc!) Use the change of base property to solve. Round to 3 decimal places.

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|----------------------|----------------------|------------------------|---------------------|
| 17. $\log_5 120 = x$ | 18. $\log_3 0.9 = x$ | 19. $4^x = 99$ | 20. $6^x = 729$ |
| 21. $7^x = 4.88$ | 22. $12^x = 5.75$ | 23. $\log_{2.8} 7 = x$ | 24. $8(0.95)^x = 2$ |

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