

Name: _____ Per: _____ Date: _____

Use the properties of logarithms to rewrite the expression in terms of $\log 2$ and $\log 7$.
Then use $\log 2 \approx 0.301$ and $\log 7 \approx 0.845$ to approximate the expression.

1. $\log 4$	2. $\log 14$	3. $\log\left(\frac{7}{2}\right)$
4. $\log\left(\frac{7}{2}\right)$	5. $\log 7^{-3}$	6. $\log 49$

Expand the following expressions:

7. $\log_2(3x)$

$\log_2 3 + \log_2 x$

8. $\log_3\left(\frac{9}{x}\right)$

9. $\log_2\left(\frac{x^3\sqrt{x-1}}{x^3(x-1)^{1/2}}\right)$

10. $\log_3 3x^{\frac{2}{3}}y^5$

11. $\log_3 x^5$

12. $\log_4 2y^2\sqrt{x}$

$\log_4 \frac{2y^2}{x^{\frac{1}{2}}}$

$\log_4 2 + \log_4 y^2 + \log_4 x^{\frac{1}{2}}$

$\log_4 2 + 2\log_4 y + \frac{1}{2}\log_4 x$

13. $\log x^{\frac{1}{2}}y^4$

14. $\log\left(\frac{6}{x}\right)$

15. $\log\left(\frac{x}{5}\right)$

16. $\log \frac{x^2}{yz^3}$

17. $\log x^{-3}$

18. $\log_2(x\sqrt{x+1})$

e

Convert Log to Exponential:

19. $\log_3(x-2) = 4$

20. $\log_x \frac{1}{81} = -4$

21. $\log a = z$

Convert Exponential to Log

22. $x^{-3} = \frac{1}{64}$

23. $9^x = w$

24. $b^t = k$

Solve:

~~25. $4(3^{x-2}) - 11 = 313$~~

~~26. $5^{x-18} = \left(\frac{1}{625}\right)^{2x}$~~

~~27. $3 \log_4(x+3) + 16 = 22$~~