Name:_____

4.2 Laws of Logs/Change of Base

We did a quizizz in the hallway over this material!!

Use laws of logs to expand the expression

1. $\log_2(2x)$

2. $\log_2(x(x-1))$

3. $\log_2(AB^2)$

4. $\log_3(x\sqrt{y})$

5. $\log_5 \sqrt[3]{x^2+1}$

6. $\log\left(\frac{x^3y^4}{z^6}\right)$

7. $\log_2\left(\frac{x(x^2+1)}{\sqrt{x^2-1}}\right)$

8. $\ln\left(x\sqrt{\frac{y}{z}}\right)$

9. $\log\sqrt[4]{x^2+y^2}$

10. $\ln\left(\frac{x^3\sqrt{x-1}}{3x+4}\right)$

Use the laws of logarithms to condense the expression.

11. $\log_3 5 + 5\log_3 2$

12. $\log 12 + \frac{1}{2}\log 7 - \log 2$

13. $\log_2 A + \log_2 B - 2\log_2 C$

14. $\log_5\left(x^2 - 1\right) - \log_5(x - 1)$

15. $4\log x - \frac{1}{3}\log\left(x^2 + 1\right) + 2\log(x - 1)$

16. $\ln(a + b) + \ln(a - b) - 2\ln c$

17. $\ln 5 + 2\ln x + 3\ln\left(x^2 + 5\right)$

18. $2\left(\log_5 x + 2\log_5 y - 3\log_5 z\right)$

19. $\frac{1}{3}\log(2x + 1) + \frac{1}{2}\left[\log(x - 4) - \log\left(x^4 - x^2 - 1\right)\right]$

20. $\log_a b + c\log_a d - r\log_a s$

Use the change of base formula and a calculator to evaluate the logarithm, correct to six decimal places.

21. $\log_2 5$

22. $\log_5 2$

23. $\log_3 16$

24. $\log_6 92$