

Name:
Instructor:

Date:
Section:

Practice Set 9.4

Use the choices to fill in each blank.

product
quotient

power
argument

positive
negative

addition
subtraction

- When finding the logarithm of an expression, the expression is called the _____ of the logarithm.
- The _____ rule of logarithms tells us that the product of two factors equals the sum of the logarithms of the factors.
- The _____ rule of logarithms tells us that the logarithm of a number raised to a power equals the exponent times the logarithm of the number.
- The _____ rule for logarithms tells us that the logarithm of a quotient equals the difference between the logarithm of the numerator and the logarithm of the denominator.

Use the properties of logarithms to expand.

5. $\log_5(4 \cdot 7)$

6. $\log_2 x(x + 3)$

5. _____

6. _____

7. $\log_9 \frac{3}{4}$

8. $\log_3 \frac{\sqrt{x}}{x+1}$

7. _____

8. _____

9. $\log_4(r + 3)^3$

10. $\log_6 x^2(x - 1)^3$

9. _____

10. _____

11. $\log_7 \frac{y^3(y-1)}{y^2}$

12. $\log_5 \sqrt{\frac{a^5}{a+4}}$

11. _____

12. _____

Write as a logarithm of a single expression.

13. $\log_3 5 + \log_3 6$

14. $\log_6 15 - \log_6 3$

13. _____

14. _____

15. $3 \log_2 5$

16. $\log_{10} x + \log_{10}(x - 1)$

15. _____

16. _____

17. $2 \log_3 y - 3 \log_3(y - 1)$

18. $2 \log_7(a + 1) + 3 \log_7(a - 2)$

17. _____

18. _____

Evaluate.

19. $\log_4 64$

20. $\log_7 7$

19. _____

20. _____

21. $2 \log_4 \sqrt{4}$

22. $3^{\log_3 7}$

21. _____

22. _____

23. $6^{\log_6 11}$

24. $\frac{1}{3} \log_3 \sqrt{3}$

23. _____

24. _____