1, 2, 6, 8, 9, 12, 14, 15, 18, 19, 21, 23, 28, 31

Name:	Date:
Topic:	Class:

Main Ideas/Questions	Notes/Examples
Product Property $\log_b(m \cdot n) =$	**Condense into a single logarithm. Simplify if possible.** **1.** $\log_2 7 + \log_2 4$ **2.** $\log 25 + \log 4$ **3.** $\log_4 2x + \log_4 4x^2$ **Expand using the product property.** **4.** $\log 6$ **5.** $\log_7 45$ **6.** $\log_2(5x)$
Quotient Property $\log_b\left(\frac{m}{n}\right) =$	**Condense into a single logarithm. Simplify if possible.** **7.** $\log_3 24 - \log_3 8$ **8.** $\log_2 15 - \log_2 15$ **9.** $\log_4 x^9 - \log_4 x^2$ **Expand using the quotient property.** **10.** $\log_8 4$ **11.** $\log_5 \frac{1}{3}$ **12.** $\log\left(\frac{m}{7}\right)$
Power Property $\log_b m^n =$	**Condense into a single logarithm. Simplify if possible.** **13.** $5 \cdot \log_4 2$ **14.** $7 \cdot \log_2 x$ **15.** $\frac{1}{3} \cdot \log 8$ **Expand using the power property. Simplify if possible.** **16.** $\log_2 8^7$ **17.** $3 \cdot \log 4^{x-1}$ **18.** $\log_7 \sqrt{w}$

Putting it All Together!

CONDENSING LOGS

Directions: Rewrite as a single logarithm. Simplify if possible.

19. $2 \cdot \log 6 - \log 9$

20. $4 \cdot \log_4 a + 2 \cdot \log_4 b$

21. $7 \cdot \log_4 u - 3 \cdot \log_4 v^2$

22. $\log_2 15 + \log_2 4 - \log_2 6$

23. $\log_3 4 + \log_3 y + \frac{1}{2} \cdot \log_3 49$

24. $\frac{1}{3}(\log_5 8 + \log_5 27) - \log_5 3$

25. $3 \cdot \log_2 4 - \log_2 32$

26. $2 \cdot \log 6 - \frac{1}{4} \cdot \log 16 + \log 3$

EXPANDING LOGS

Directions: Expand each logarithm.

27. $\log_6 (xyz^4)$

28. $\log_4 \left(\frac{a^9}{b}\right)$

29. $\log_7 (q^4 r^2)^2$

30. $\log_2 \left(\frac{y}{z^5}\right)^2$

31. $\log \sqrt{7x^3}$

32. $\log_3 \sqrt[4]{m^5 n^2}$