

Complete the following table using your calculator. Round answers to four decimal places.

log 5	0.6990
log 10 - log 2	0.6990
log 3	0.4771
log 18 - log 6	0.4771
log 7	0.8451
log 28 - log 4	0.8451
log 1/2	-0.3010
log 3 - log 6	-0.3010
log 2	0.3010
log 8 - log 4	0.3010

1. Using any patterns you see in the table, what generalizations could be made?

$$\log a - \log b = \log\left(\frac{a}{b}\right)$$

2. Complete the statement:

$$\log 32 - \log \underline{8} = \log 4$$

Complete the following table using your calculator. Round answers to four decimal places.

log 12	1.0792
log 6 + log 2	1.0792
log 18	1.2553
log 6 + log 3	1.2553
log 20	1.3010
log 4 + log 5	1.3010
log 26	1.4150
log 2 + log 13	1.4150
log 32	1.505
log 8 + log 4	1.505
log 9	0.9542
log 3 + log 3	0.9542

1. Using any patterns you see in the table, what generalizations could be made?

$$\log a + \log b = \log(a \cdot b)$$

2. Complete the statement:

$$\log 10 + \log \underline{5} = \log 50$$

Complete the following table using your calculator. Round answers to four decimal places.

4 log 2	1.2041
log 16	1.2041
2 log 5	1.3979
log 25	1.3979
log 1/2	-0.3010
-log 2	-0.3010
6 log 2	1.806
log 64	1.806
2 log 7	1.6902
log 49	1.6902

1. Using any patterns you see in the table, what generalizations could be made?

$$n \log a = \log a^n$$

2. Complete the statement:

$$3 \log 2 = \log \underline{2^3}$$

Summary

	Property of Logs	Property of Exponents
Product	$\log a + \log b = \log(a \cdot b)$	$2^a \cdot 2^b = 2^{a+b}$
Quotient	$\log a - \log b = \log\left(\frac{a}{b}\right)$	$\frac{2^a}{2^b} = 2^{a-b}$
Power	$n \log a = \log a^n$	$(2^a)^b = 2^{ab}$

Explain the relationship between the properties of logarithms and exponents.

Condense.

①  $\log_b 6 + \log_b 5 - \log_b 2$

②  $\log_7 x - 3 \log_7 y$

③  $\log_5 x - \log_5 y + 2$

④  $\log_4 3 - \log_4 48$

Expand.

①  $\log_3 N^6$

②  $\log_3 \left(\frac{M}{N^3}\right)$

③  $\log_3 \sqrt{M}$

④  $\log_3 \frac{1}{N\sqrt{N}}$

⑤  $\log_2 (MN)^4$

CW: P. 475 OE # 1-19 000