

4. Evaluate each logarithm.

a) $\log_2 16$

b) $\log_2 4$

c) $\log_3 27$

d) $\log_5 25$

e) $\log_5 \left(\frac{1}{5}\right)$

f) $\log_7 7$

g) $\log_3 1$

h) $\log_4 64$

5. Choose two expressions in exercise 4. Explain how you determined the logarithms.

6. Write in exponential form.

a) $\log_2 8 = 3$

b) $\log_2 32 = 5$

c) $\log_6 36 = 2$

d) $\log_5 625 = 4$

e) $\log_{16} 4 = \frac{1}{2}$

f) $\log_2 \left(\frac{1}{4}\right) = -2$

7. Write in logarithmic form.

a) $7^2 = 49$

b) $3^5 = 243$

c) $2^0 = 1$

d) $5^{-1} = 0.2$

e) $2^{-3} = \frac{1}{8}$

f) $25^{0.5} = 5$

8. Refer to exercise 3. The numbers following the logarithm symbols are powers of 10, 3, and a with positive exponents.a) Write similar lists of logarithms involving powers of 10, 3, and a with negative exponents.

b) Determine the logarithms in the lists in part a.

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Explain what is meant by a logarithm. Use some examples to illustrate your explanation.

b) All logarithms are 0, -1, -2, -3, ..., -n

log₃ 3⁻ⁿ; log_a 1, log_a a⁻¹, log_a a⁻², log_a a⁻³, ..., log_a a⁻ⁿlog 10⁻ⁿ; log₃ 1, log₃ ($\frac{1}{3}$), log₃ ($\frac{1}{9}$), log₃ ($\frac{1}{27}$), ...

8. a) log 1, log 0.1, log 0.01, log 0.001, ...

d) log₅ 0.2 = -1 e) log₂ $\frac{1}{8}$ = -3 f) log₂ 5 = 0.57. a) log₇ 49 = 2 b) log₃ 243 = 5 c) log₂ 1 = 0d) 5⁴ = 625 e) 16² = 4 f) 2⁻² = $\frac{1}{4}$ 6. a) 2³ = 8 b) 2⁵ = 32 c) 6² = 36

d) -1 e) 1 f) 0 g) 3 h) 2

e) 0, 1, 2, 3, ..., n

f) 0, 1, 2, 3, ..., n

g) 0, 1, 2, 3, ..., n

h) 0, 1, 2, 3, ..., n

i) -0.346 79 j) 2.255 27 k) 3.707 57

l) 1.372 91 m) -1.142 67 n) -2.537 60

1. Explanations may vary.