

Precalculus - Logarithms and Their Properties - Test Answer Key

Common Core F-LE.A.4, F-IF.C.7e, F-BF.B.5 · maths-pdf.fr/en/

Worked solutions and scoring notes for the 9-question logarithms test. Use the scoring line under each solution to award partial credit.

Precalculus · Common Core State Standards: **F-LE.A.4, F-IF.C.7e, F-BF.B.5**

Question 1 - Convert [2 pts]

(a) $\log_3 81 = 4$. (b) $2^{-4} = \frac{1}{16}$.

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Scoring: 1 point each.

Question 2 - Evaluate [2 pts]

$5^3 = 125$. $\left(\frac{1}{3}\right)^{-2} = 9$.

3 and -2

Scoring: 1 point each.

Question 3 - Domain [2 pts]

$5-x > 0$ gives $x < 5$. The asymptote is where $5-x = 0$.

Domain $(-\infty, 5)$; asymptote $x = 5$

Scoring: 1 point each.

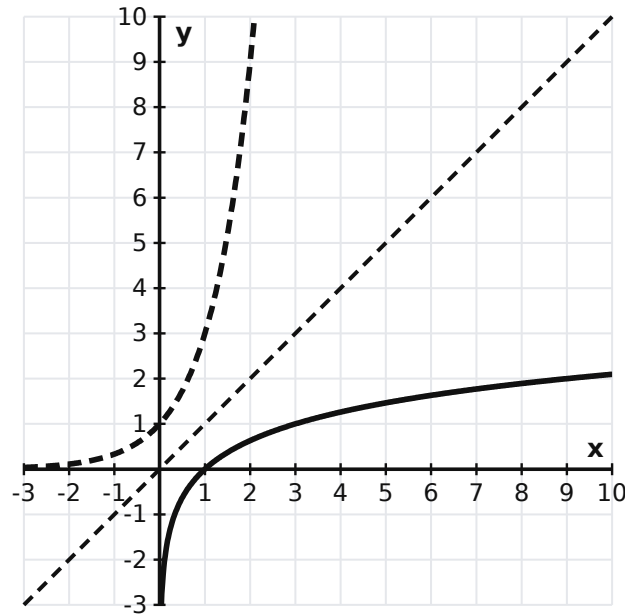
Question 4 - Expand [2 pts]

$\log x^2 + \log y^{1/2} - \log z$.

$2\log x + \frac{1}{2}\log y - \log z$

Scoring: 1 point for the product and quotient structure, 1 point for the powers.

Question 5 - Read a log graph [3 pts]



The log and exponential graphs mirror each other.

(a) $x = 0$. (b) Domain $(0, \infty)$; range all real numbers. (c) $y = 3^x$.

$x = 0$; $(0, \infty)$, all reals; $y = 3^x$

Scoring: 1 point for each part.

Question 6 - Condense [2 pts]

$$\ln x^3 - \ln y^2 + \ln 5 = \ln \frac{5x^3}{y^2}.$$

$$\ln \frac{5x^3}{y^2}$$

Scoring: 1 point for the powers, 1 point for combining.

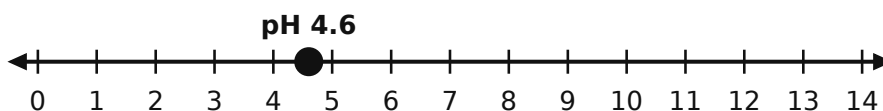
Question 7 - Change of base [2 pts]

$$\frac{\ln 50}{\ln 7} = \frac{3.9120}{1.9459} \approx 2.010.$$

$$2.010$$

Scoring: 1 point for the formula, 1 point for the value.

Question 8 - pH model [3 pts]



The pH is about 4.6.

(a) $-\log(2.5 \times 10^{-5}) \approx 4.60$, about 4.6. (b) 10^{-8} . (c) $10^{-3} \div 10^{-5} = 100$.

4.6; 10^{-8} ; 100 **times**

Scoring: 1 point for each part.

Question 9 - Use given logs [2 pts]

$$\log_b 10 = 0.69 + 1.61 = 2.30. \log_b 2.5 = \log_b \frac{5}{2} = 1.61 - 0.69 = 0.92.$$

2.30 **and** 0.92

Scoring: 1 point each.

Total
20 points