

## Desmos VS TI 84 on Graphing a Logarithmic Function

Lesson 097 | Algebra II | Exponential functions and models • Logarithms and their properties

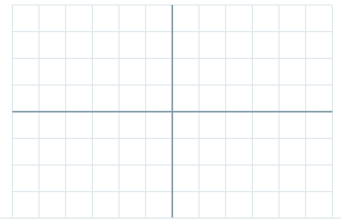
[https://www.youtube.com/watch?v=7XoxYf\\_40Lw](https://www.youtube.com/watch?v=7XoxYf_40Lw)

Original practice aligned to the saved video title.

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Show your reasoning.

**01**

Graph  $f(x) = 2^{(x - (-5))} + 9$ . Give its asymptote, domain, range, and two points.

**02**

For positive  $x$  and  $y$ , expand  $\log_5(4x^6/y^7)$ .

**03**

A population follows  $P(t) = 900 \cdot 5^t$ . Find  $P(0)$ ,  $P(2)$ , and the multiplication factor per time unit.

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**04**

Graph  $y = \log_2(x - (9)) + 5$ . Give domain, vertical asymptote, and two exact points.

**05**

A population follows  $P(t) = 700 \cdot 3^t$ . Find  $P(0)$ ,  $P(2)$ , and the multiplication factor per time unit.

**06**

For positive  $x$  and  $y$ , expand  $\log_2(3x^{10}/y^6)$ .

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01

Graph  $f(x) = 2^{(x - (-5))} + 9$ . Give its asymptote, domain, range, and two points.

Shift  $y=2^x$  horizontally by -5 and up 9. Asymptote  $y=9$ ; domain all real  $x$ ; range  $(9, \infty)$ . Points  $(-5, 10)$  and  $(-4, 11)$ .

02

For positive  $x$  and  $y$ , expand  $\log_5(4x^6/y^7)$ .

Use product, quotient, and power rules:  $\log_5(4) + 6\log_5(x) - 7\log_5(y)$ .

03

A population follows  $P(t) = 900 \cdot 5^t$ . Find  $P(0)$ ,  $P(2)$ , and the multiplication factor per time unit.

$P(0) = 900$ ;  $P(2) = 22500$ . Each increase of one in  $t$  multiplies the population by 5.

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04

Graph  $y = \log_2(x - (9)) + 5$ . Give domain, vertical asymptote, and two exact points.

Argument must be positive:  $x > 9$ . Asymptote  $x = 9$ . Since  $\log_2(1)=0$  and  $\log_2(2)=1$ , points are  $(10, 5)$  and  $(11, 6)$ .

05

A population follows  $P(t) = 700 \cdot 3^t$ . Find  $P(0)$ ,  $P(2)$ , and the multiplication factor per time unit.

$P(0) = 700$ ;  $P(2) = 6300$ . Each increase of one in  $t$  multiplies the population by 3.

06

For positive  $x$  and  $y$ , expand  $\log_2(3x^{10}/y^6)$ .

Use product, quotient, and power rules:  $\log_2(3) + 10\log_2(x) - 6\log_2(y)$ .