

Discovering the Truth Rigorous of Bacteria Growth or Decay and Logistic Growth Applicat...

Lesson 219 | Precalculus | Exponential functions and models • Logistic growth

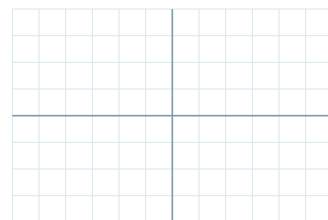
<https://www.youtube.com/watch?v=u3E59Fxx8I0>

Original practice aligned to the saved video title.

Name: _____ Date: _____ Show your reasoning.

01

Graph $f(x) = 6^{(x - (-4))} + 14$. Give its asymptote, domain, range, and two points.

**02**

A population is $P(t) = 1100 / (1 + 7e^{(-2t)})$. Find $P(0)$, the carrying capacity, and the time it reaches half capacity.

03

A population follows $P(t) = 400 \cdot 6^t$. Find $P(0)$, $P(2)$, and the multiplication factor per time unit.

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04

A population is $P(t) = 600/(1 + 10e^{-4t})$. Find $P(0)$, the carrying capacity, and the time it reaches half capacity.

05

A population follows $P(t) = 900 \cdot 3^t$. Find $P(0)$, $P(2)$, and the multiplication factor per time unit.

06

A population is $P(t) = 1000/(1 + 3e^{-6t})$. Find $P(0)$, the carrying capacity, and the time it reaches half capacity.

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01

Graph $f(x) = 6^{(x - (-4))} + 14$. Give its asymptote, domain, range, and two points.

Shift $y=6^x$ horizontally by -4 and up 14. Asymptote $y=14$; domain all real x ; range $(14, \infty)$. Points $(-4, 15)$ and $(-3, 20)$.

02

A population is $P(t)=1100/(1+7e^{(-2t)})$. Find $P(0)$, the carrying capacity, and the time it reaches half capacity.

$P(0)=275/2$. As $t \rightarrow \infty$, the exponential tends to 0, so capacity=1100. Half capacity requires $7e^{(-2t)}=1$; $t=\ln(7)/2$.

03

A population follows $P(t) = 400 \cdot 6^t$. Find $P(0)$, $P(2)$, and the multiplication factor per time unit.

$P(0) = 400$; $P(2) = 14400$. Each increase of one in t multiplies the population by 6.

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04

A population is $P(t) = 600/(1 + 10e^{-4t})$. Find $P(0)$, the carrying capacity, and the time it reaches half capacity.

$P(0) = 600/11$. As $t \rightarrow \infty$, the exponential tends to 0, so capacity = 600. Half capacity requires $10e^{-4t} = 1$; $t = \ln(10)/4$.

05

A population follows $P(t) = 900 \cdot 3^t$. Find $P(0)$, $P(2)$, and the multiplication factor per time unit.

$P(0) = 900$; $P(2) = 8100$. Each increase of one in t multiplies the population by 3.

06

A population is $P(t) = 1000/(1 + 3e^{-6t})$. Find $P(0)$, the carrying capacity, and the time it reaches half capacity.

$P(0) = 250$. As $t \rightarrow \infty$, the exponential tends to 0, so capacity = 1000. Half capacity requires $3e^{-6t} = 1$; $t = \ln(3)/6$.