



Happy Halloween!

Monday, October 31, 2016

New Seats

New Calendar

New Chapter - Ch. 3 - Exponents, Logistics, & Logarithms

3.1 - Exponential and Logistic Functions

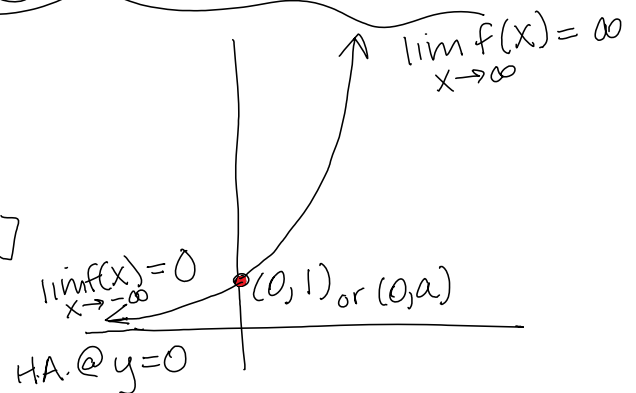
3.1 Exponential and Logistic Functions

Exponential Model

$$f(x) = a \cdot b^x$$

$a \neq 0$ initial value [y-int]

$b > 0, b \neq 1$ base



① Evaluate $f(x) = 2^x$ for :

(A) $f(4) = 2^4 = 16$
 (B) $f(0) = 2^0 = 1$
 (C) $f(-3) = 2^{-3} = \frac{1}{2^3} = \frac{1}{8}$

(D) $f(\frac{1}{2}) = 2^{\frac{1}{2}} = \sqrt{2}$
 (E) $f(-\frac{3}{2}) = 2^{-\frac{3}{2}} = \frac{1}{2^{\frac{3}{2}}} = \frac{1}{\sqrt{8}} = \frac{1}{2\sqrt{2}}$

② Write an exponential function that passes thru $(0, 4)$ and $(2, 8)$.

$(0, a)$ ← y-int x y

$$y = a \cdot b^x$$

$$\frac{8}{4} = \frac{4 \cdot b^2}{4}$$

$$\sqrt{2} = \sqrt{b^2}$$

$$\pm\sqrt{2} = b$$

$$y = 4 \cdot \sqrt{2}^x$$

$$\text{OR } y = 4 \cdot 2^{\frac{1}{2}x}$$

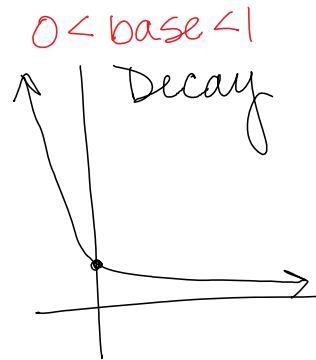
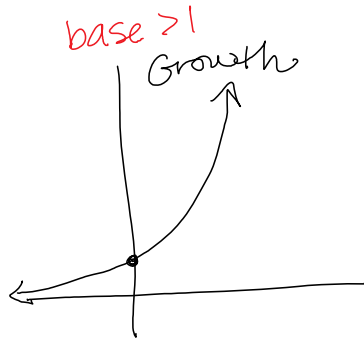
Exponential Growth + Decay

Ⓐ $y = 2 \cdot 3^x$
Growth

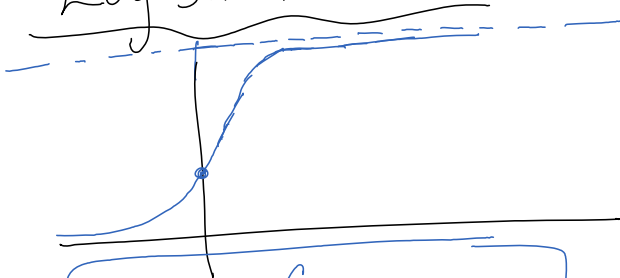
Ⓑ $y = 4 \left(\frac{1}{2}\right)^x$
Decay

Ⓒ $y = \frac{1}{2} \cdot 4^x$
Growth

Ⓓ $y = 3 \cdot 4^{-x}$
 $= 3 \cdot \left(\frac{1}{4}\right)^x$
Decay



Logistic Model



Limit to Growth
H.A. @ $y=1$

$$f(x) = \frac{C}{1 + a \cdot b^x}$$

@ $y=0$

$$f(x) = \frac{1}{1 + e^{-x}}$$

$C = \text{Limit to Growth}$

① $f(x) = \frac{20}{1 + 2e^{-3x}}$

graph on calculator,
find HAs, y-int.

