

Mar. 8, 2017

Sect. 5-2

Exponential Functions

Graphing

Exp. Growth/Decay

## Exponential Funct.

$$f(x) \text{ or } y = C(b^x)$$

coeff.      base

exp. funct. because  $x$  is in exponent

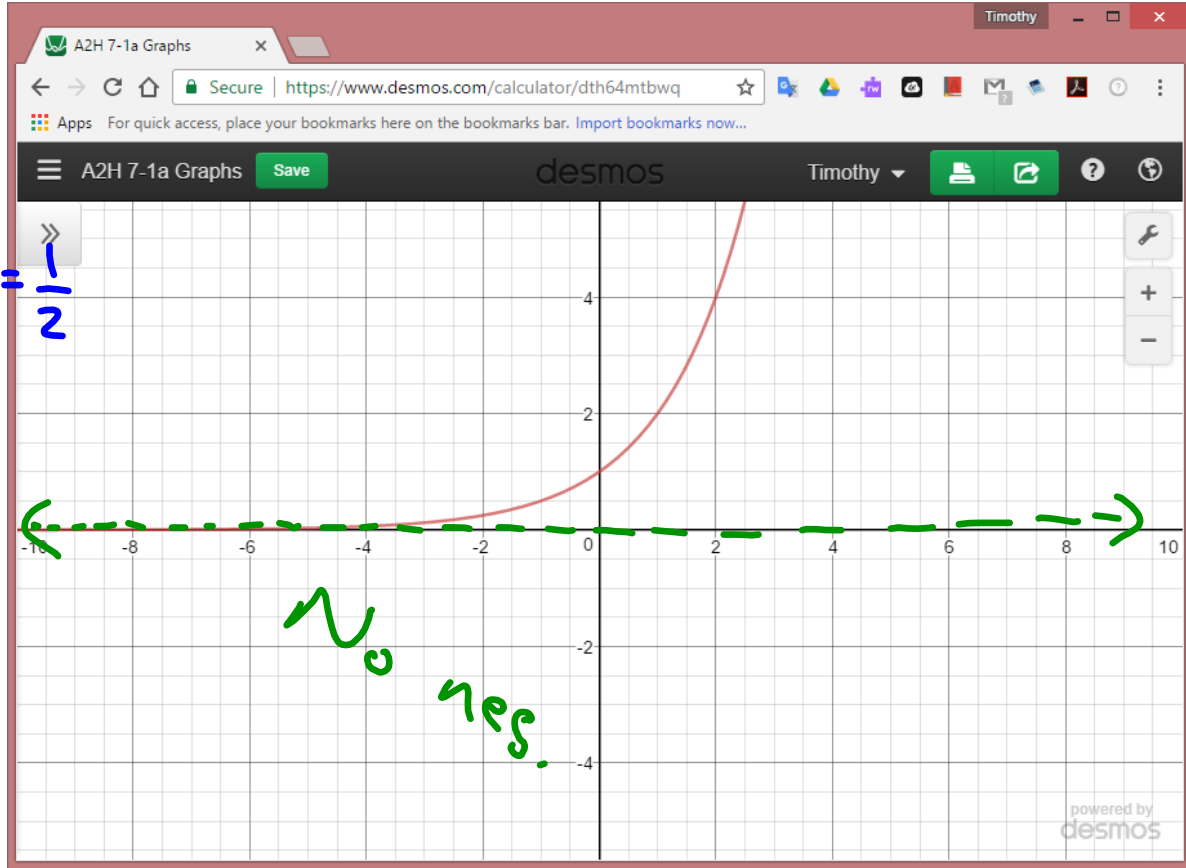
e.g.  $f(x) = 2^x$

Rule: base  $\neq 1$   
base is positive

x	y
-2	$\frac{1}{4}$
-1	$\frac{1}{2}$
0	1
1	2
2	4

$$y = 2^x$$

$$2^{-1} = \frac{1}{2^1} = \frac{1}{2}$$



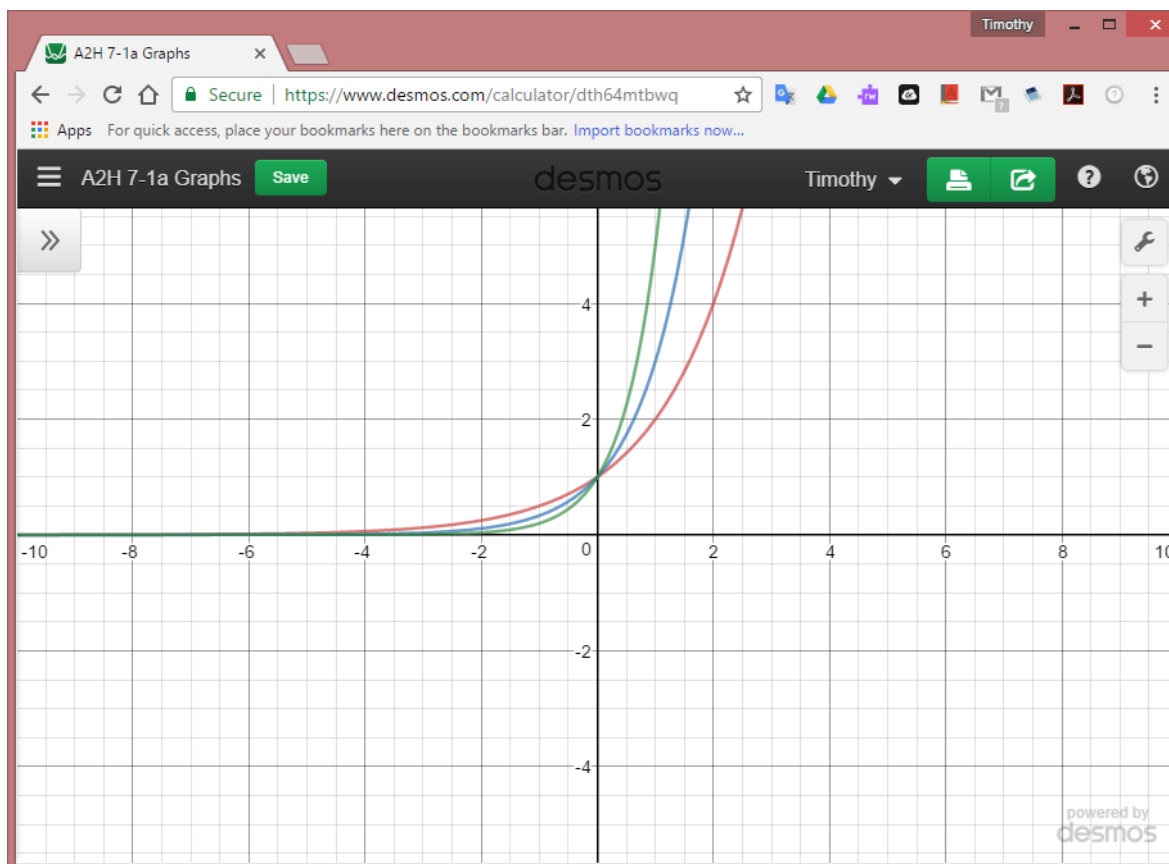
Change the  
base

$$y = 2^x$$

$$y = 3^x$$

$$y = 5^x$$

Bigger base,  
faster growth



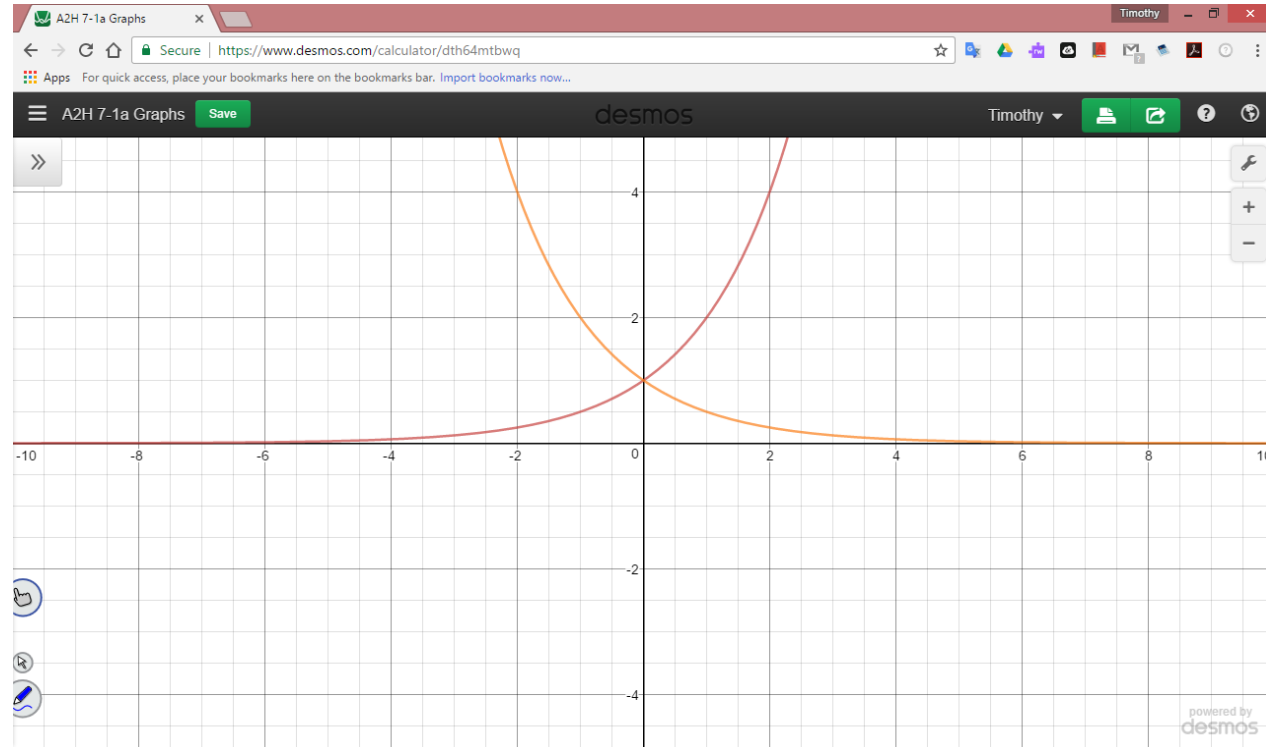
Base

0 < b < 1

$$y = 2^x$$

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

Graph goes  
down  
called  
decay



To play with the exponential graphs, click here.

<https://www.desmos.com/calculator/u93sxnejlt>

## Applications

$$P(t) = 1.2(2.59)^t$$

$t$  is # of years after 2003

Revenue is in millions USD

a) Initial Revenue ( $t=0$ )

$$P(0) = 1.2(2.59)^0 = \$1.2 \text{ mil.}$$

b) What is Growth Factor?

Base of exp.  $GF = 2.59$

Extra { Percentage Growth:  
 $2.59 - 1.00 = 1.59 \Rightarrow 159\%$

c) Revenue in 2006? ( $t=3$ )

$$P(3) = 1.2(2.59)^3$$

$$\approx \$ 21 \text{ mil}$$