

# Exponential Functions - Engaging Resources

## RF SO5,6 - Exponential Functions Concept Summary Sheet

(Download: [Exponential Functions Concept Map.pdf](#))

This chart may help students see the big picture and the connections within the topic.

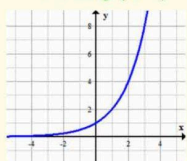
### Exponential Functions

#### Exponential Functions - Characteristics

$$y = a(b)^x; a \neq 0, b > 0, b \neq 1$$

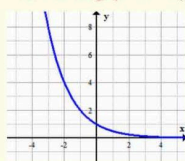
$a \Rightarrow$  y-intercept  
 $b \Rightarrow$  increasing or decreasing

Increasing ( $b > 1$ )



$b = 2$ ; doubling  
 $b = 3$ ; tripling  
 $b = 1 + \%$ ; % growth

Decreasing ( $0 < b < 1$ )



$b = 0.5$ ; halving  
 $b = 1 - \%$ ; % decrease

x - intercept: none  
y - intercept:  $(0, a)$

Domain:  $x \in R$   
Range:  $y > 0, y \in R$

#### Exponential Functions - Solving Equations

Common Base

$$a^m = a^n \text{ then } m = n$$

Useful exponent laws:

$$(a^m)^n = a^{mn} \quad \frac{1}{a^n} = \sqrt[n]{a}$$

$$\frac{1}{a^m} = a^{-m} \quad a^0 = 1$$

Graphically

$Y_1 = \text{left side}$   
 $Y_2 = \text{right side}$   
CALC - INTERSECT

Verify by Substitution

#### Exponential Functions - Modelling

Determine an equation that may model given data, in order to solve problems.

Table Given

Perform an exponential regression with your graphing calculator.

Description Given

Generate a table of data, and then perform an exponential regression with your graphing calculator.

$$y = a(b)^x$$

#### Financial Applications - Compound Interest

$$A = P(1 + i)^n$$

A = future value

P = principal (starting value)

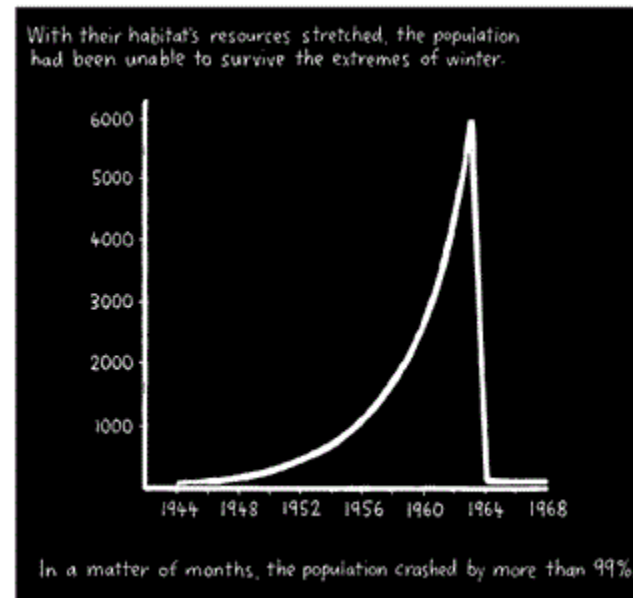
i = interest rate per compounding period

n = number of compounding periods

## RF SO6 - Real World Connection - St. Matthew Island

(Link: [Stuart McMillen - St. Matthew Island](#))

Stuart McMillen presents an interesting comic on the reindeer of St. Matthew Island. This comic may be used to make a connection between exponential functions and the real world. Students could try to reproduce the graph shown in the comic using exponential regression and then interpolate or extrapolate as per interest. Another idea would be to stop reading the comic before the population starts to decline and ask the students to predict what will happen and then finish the comic after their predictions.



## RF SO5 - Add Em Up: Group Practice solving Exponential Equations by Common Base

(Download: [Add Em Up - Exponential Equations by Changing Base.doc](#))

Great review activity to get students practising, checking solutions and helping each other to make corrections.

