



MCR 3U
3.4

Properties of Exponential Functions

Properties

Consider the function $f(x) = b^x$

What is the shape of the graph when $b > 1$?



Sketchpad
File

What is the shape of the graph when $0 < b < 1$?

What is the y-intercept?

State the Domain and Range.

Properties

Consider the function $f(x) = a(b^x)$

What happens when $a > 1$?



Sketchpad
File

What happens when $0 < a < 1$?

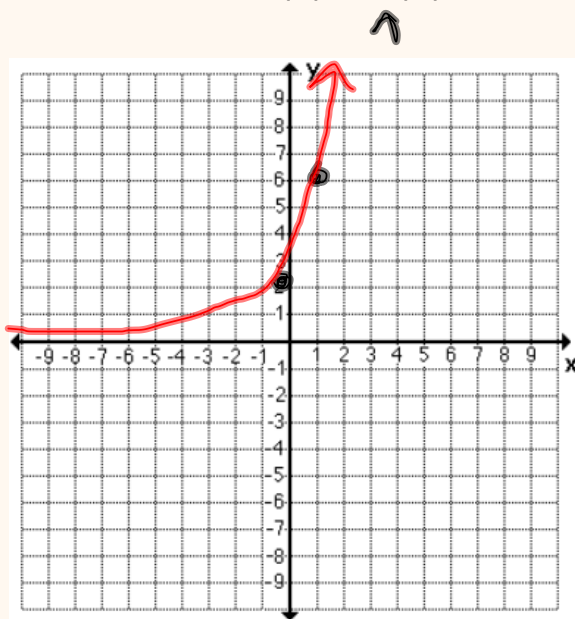
What is the y-intercept?

State the Domain and Range.

What happens when $a < 0$?

Example

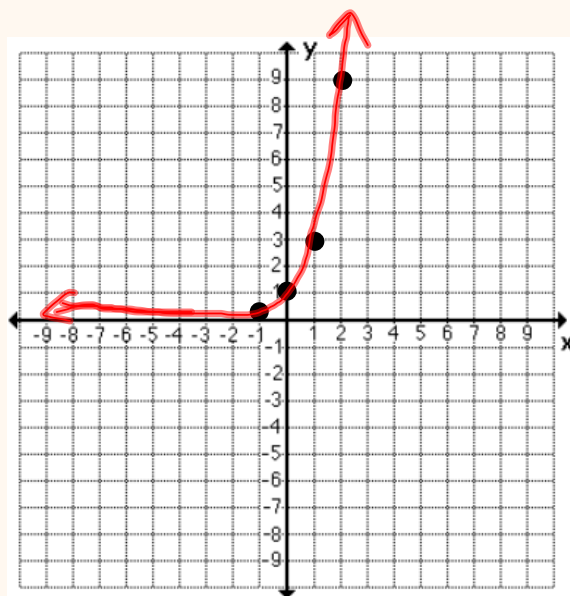
Graph the function: $f(x) = 2(3)^x$



x	y
1	6
0	2

Example

Determine the equation of a function that would fit the points.



$$y = a b^x$$

$$a = 1$$

$$y = b^x$$

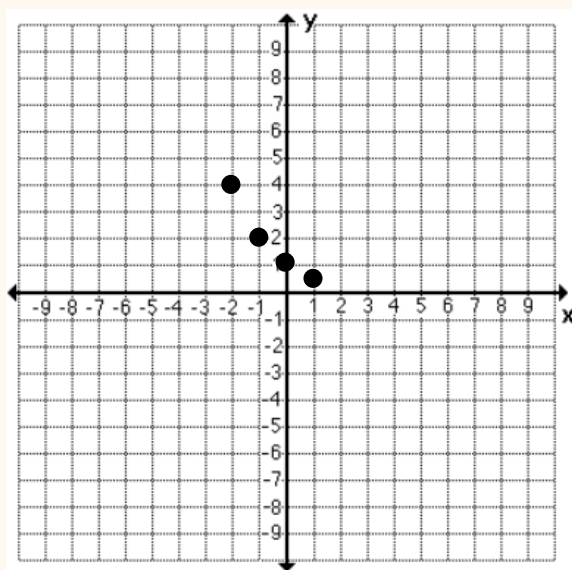
$$3 = b^1$$

$$b = 3$$

$$f(x) = 3^x$$

Example

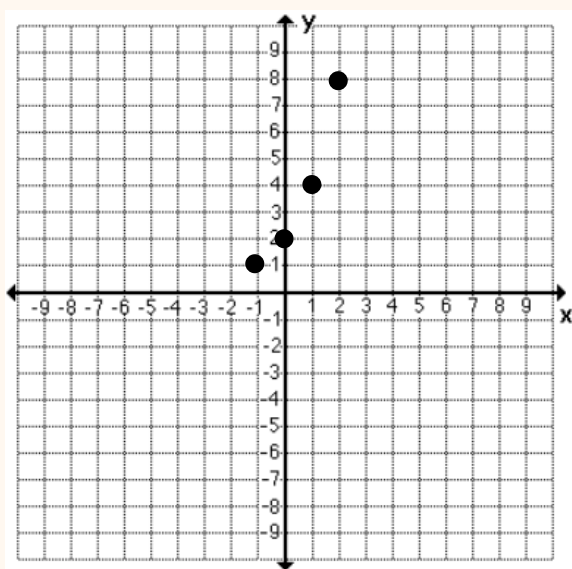
Determine the equation of a function that would fit the points.



$$\begin{aligned}
 a &= 2 \\
 y &= 2b^x \\
 \frac{4}{2} &= \frac{2b^1}{2} \\
 2 &= b \\
 f(x) &= 2(2)^x
 \end{aligned}$$

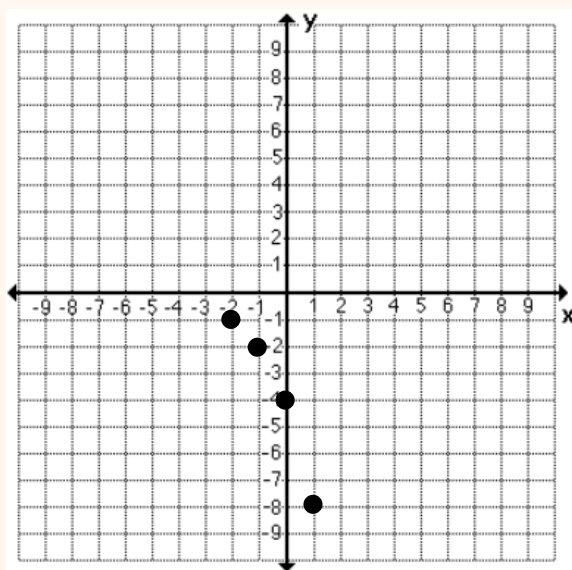
Example

Determine the equation of a function that would fit the points.



Example

Determine the equation of a function that would fit the points.



Communication

Is it possible for an exponential function of the form $f(x) = ab^x$ to have:

a) More than one y-intercept?

b) Any x-intercept?

Inquiry

How many ways is it possible for a straight line to intersect an exponential function?

Problem:



Homework

Pg. 185 # 1 - 7, 10, 14

Attachments

Matching Equivalent Expressions.doc

Graph Transformation Practice (parent-child exs) .gsp