TOC 82 Graphing Exponential Functions

WWK pge 73

exponential function: functions whose equations contain a variable in the exponent. $f(x) = b^x$

natural exponential function:

The function $f(x) = e^x$

Dec 8-10:22 AM

TOC 82 Graphing Exponential Functions

exponential function with base b

$y = b^x$ or $f(x) = b^x$

Dec 8-10:29 AM

exponential growth

equation:

initial value

$y = a \cdot b^x$

growth rate $b > 1$

"b" is larger than 1

real-world example:

You deposit $4500 in an account that pays 5% interest compounded annually. Write an exponential function to model this scenario.

Growth → $1 + 5\% = 1 + 0.05 = 1.05$

$y = a \cdot b^x$

$y = 4500(1.05)^x$

table:

Write a rule for the function.

x	-2	-1	0	1	2
y	1/8	1/2	2	8	32

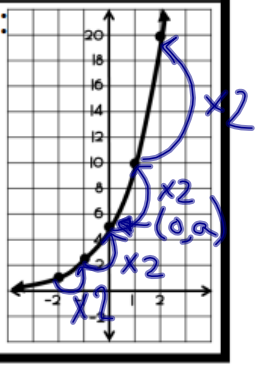
×4 ×4 ×4

$y = a \cdot b^x$

$y = 2(4)^x$

graph:

Write a rule for the function.



$y = a \cdot b^x$

$y = 5(2)^x$

Nov 8-8:35 AM

exponential decay

equation:

initial value

$y = a \cdot b^x$

growth rate $0 < b < 1$

"b" is in between 0 & 1

real-world example:

A car was purchased for $18,000. The car depreciates by 20% each year. Write an exponential function to model this scenario.

Decay → $1 - 20\% = 1 - .20 = 0.8$

$y = a \cdot b^x$

$y = 18000(0.8)^x$

table:

Write a rule for the function.

x	-2	-1	0	1	2
y	81	27	9	3	1

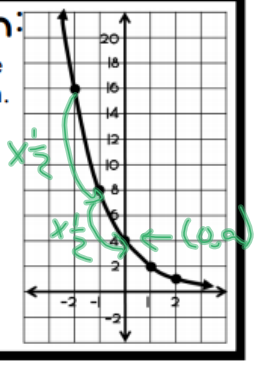
×1/3 ×1/3 ×1/3 ×1/3

$y = a \cdot b^x$

$y = 9\left(\frac{1}{3}\right)^x$

graph:

Write a rule for the function.



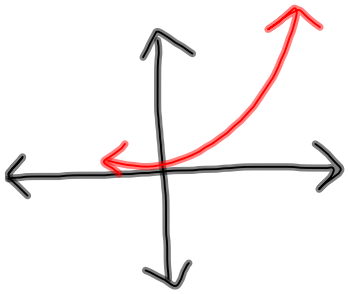
$y = a \cdot b^x$

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

Nov 8-8:35 AM

Natural Base: the # e and is approximately 2.72

f(x) = e× is the natural exponential function



Dec 9-9:59 AM

Ex: 1 (page 83)- Graph the exponential function. Start by

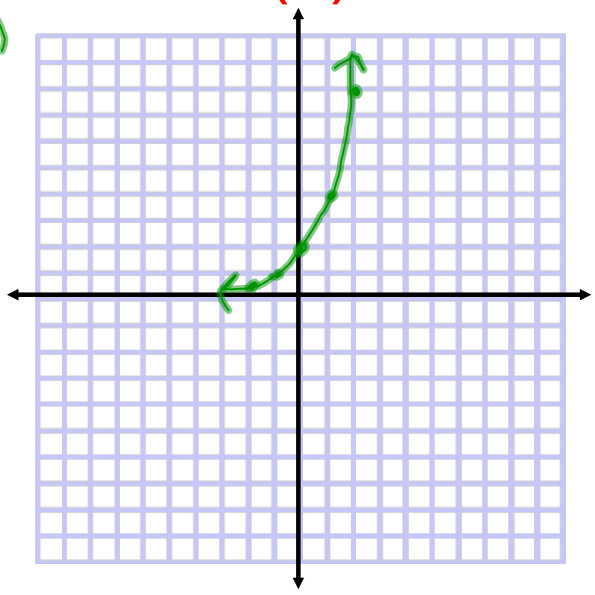
Using -2, -1, 0, 1, 2 for x . $f(x) = 2^{x+1}$

X	Y
-2	$\frac{1}{2}$
-1	1
0	2
1	4
2	8

$y = 2^{(-2+1)}$

$y = 2^{-1}$

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



Dec 9-10:06 AM

Ex2(page 83): Graph the exponential function. Start by using -2,-1, 0, 1, 2 for

$f(x) = (1/2)^{x-1}$

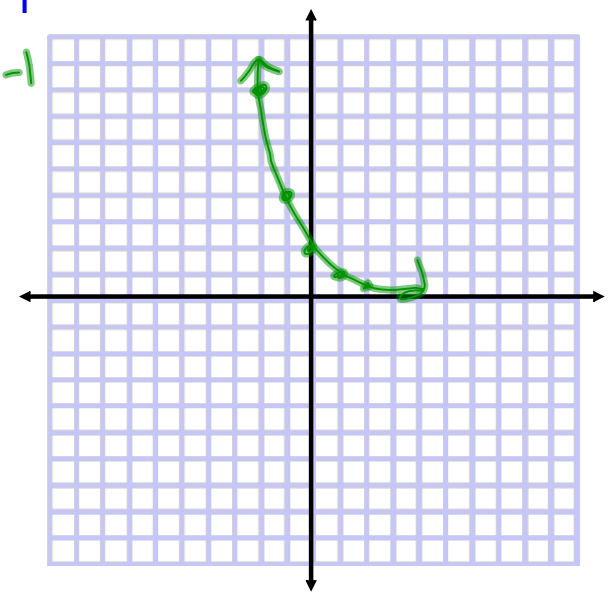
x	y
-2	8
-1	4
0	2
1	1
2	$\frac{1}{2}$

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

$= \frac{1}{2}^{-3}$

$= \frac{2^3}{1}$

$= 8$



Dec 9-10:13 AM

Ex 3(page 83): The function $f(x) = 6e^{0.013x}$ Models world

population, f(x), in billions, x years after 2000 subject to a growth rate of 1.3% annually. Use the function to find world population in 2050.

Dec 9-10:18 AM

P. 401 (pdf 427)
Section 7.3
36-39
7.4
40-44

Dec 9-10:26 AM

Nov 14-1:45 PM