

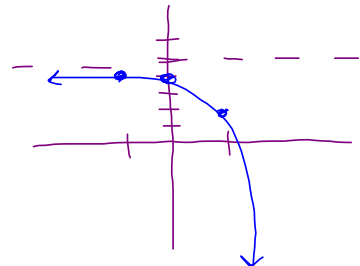
Warm up

1. State an equation of an exponential function that has been flipped over the y-axis and shifted down 2 units.

$$y = 2^{-x} - 2$$

2. Describe the transformation of $f(x) = 3^x$ to $g(x) = -3^x + 5$. Sketch $g(x)$.

flip x axis ($y \cdot (-1)$)
up 5 ($y + 5$)



x	y
-1	1/3
0	1
1	3

3'

x	y
-1	-1/3
0	-1
1	-3

x	y
-1	4 2/3
0	4
1	2

$$y = 3^{x+4} - 6$$

GO COUGARS!



Homework Questions

$$\textcircled{11} (3x^{\frac{1}{2}})(4x^{\frac{2}{3}})^2$$

$$x^6 \cdot x^4 = x^{10}$$

$$\textcircled{15} \left(\frac{27}{8}\right)^{\frac{2}{3}} \quad \left(\frac{3}{2}\right)^2$$

3.1 Day 2 Exponential Functions & Their Graphs

Base e

Applications

$f(x) = \left(1 + \frac{1}{x}\right)^x$ is a special exponential function that has a horizontal asymptote at the number 2.718281828... This number is called e.

$$e = 2.71$$

Graphs and shifts are the same as they were for other exponential functions.

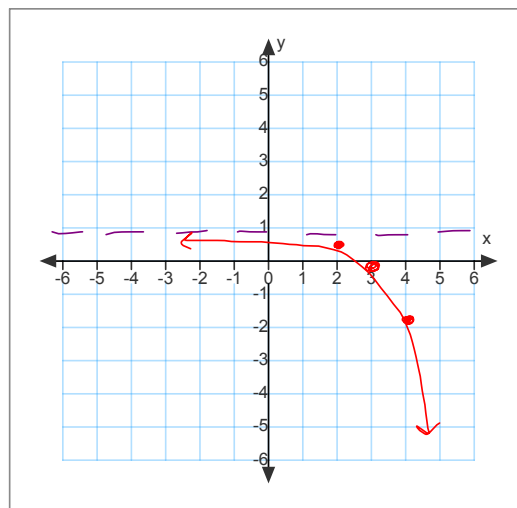
$$f(x) = e^x$$

$$f(x) = -e^{x-3} + 1$$

reflect x (y · (-1))

right (x + 3)

up 1 (y + 1)



x	y	e^x
-1	$1/3$	
0	-1	
1	-2.71	

x	y
2	$2/3$
3	0
4	-1.71

Applications

Compound interest

$$A = P \left(1 + \frac{r}{n} \right)^{nt}$$

Where A = Total amount
 P = Principal (starting Amount)
 r = interest rate decimal
 n = # of time interest is compounded per year
 t = time

0.0125

Ex. Find the balance in your account after 4 years if you make an initial deposit of \$2500 and the interest of 1.25 % was compounded monthly.

$$A = 2500 \left(1 + \frac{0.0125}{12} \right)^{12(4)} = \$2628.11$$

Interest can also be compounded continuously.
For this we use the formula

$$A = Pe^{rt}$$

Use the previous example to find the amount in the account if the interest was compounded continuously.

$$A = 2500e^{-0.125(4)} = \$2628.18$$

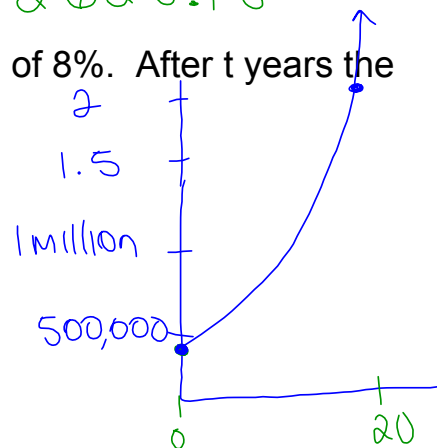
A city's population is growing at a rate of 8%. After t years the population is given by

$$P(t) = 450,000e^{0.08t}$$

a. What is the initial population?

b. What is population after 20 years?

c. Sketch a graph of the function.



HOMework



p 193 23-26, 37-43 odd by hand

53, 56, 61, 63, 67, 69

