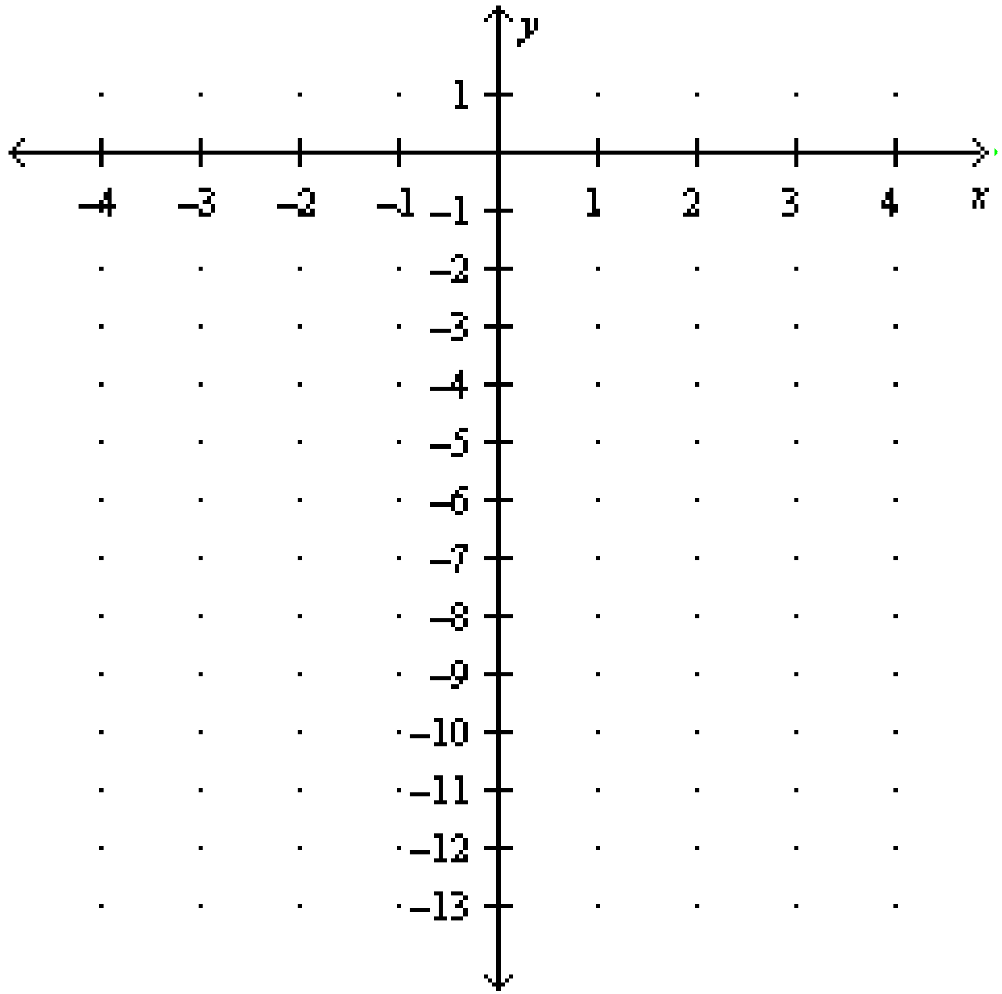
#18 ~ Sect. 8.2: Properties of Exponential Functions

Ex. 1: Graph $y = -3 \cdot 2^x$. Label the asymptote on the graph.

x	y



You can graph many exponential functions as translations of the parent function $y = ab^x$.

$$y = ab^{x-h} + k \text{ is } y = ab^x \text{ translated}$$

h units horizontally and k units vertically .

Ex.2: Graph the function as a translation of its parent function.
Label the asymptote on the graph.

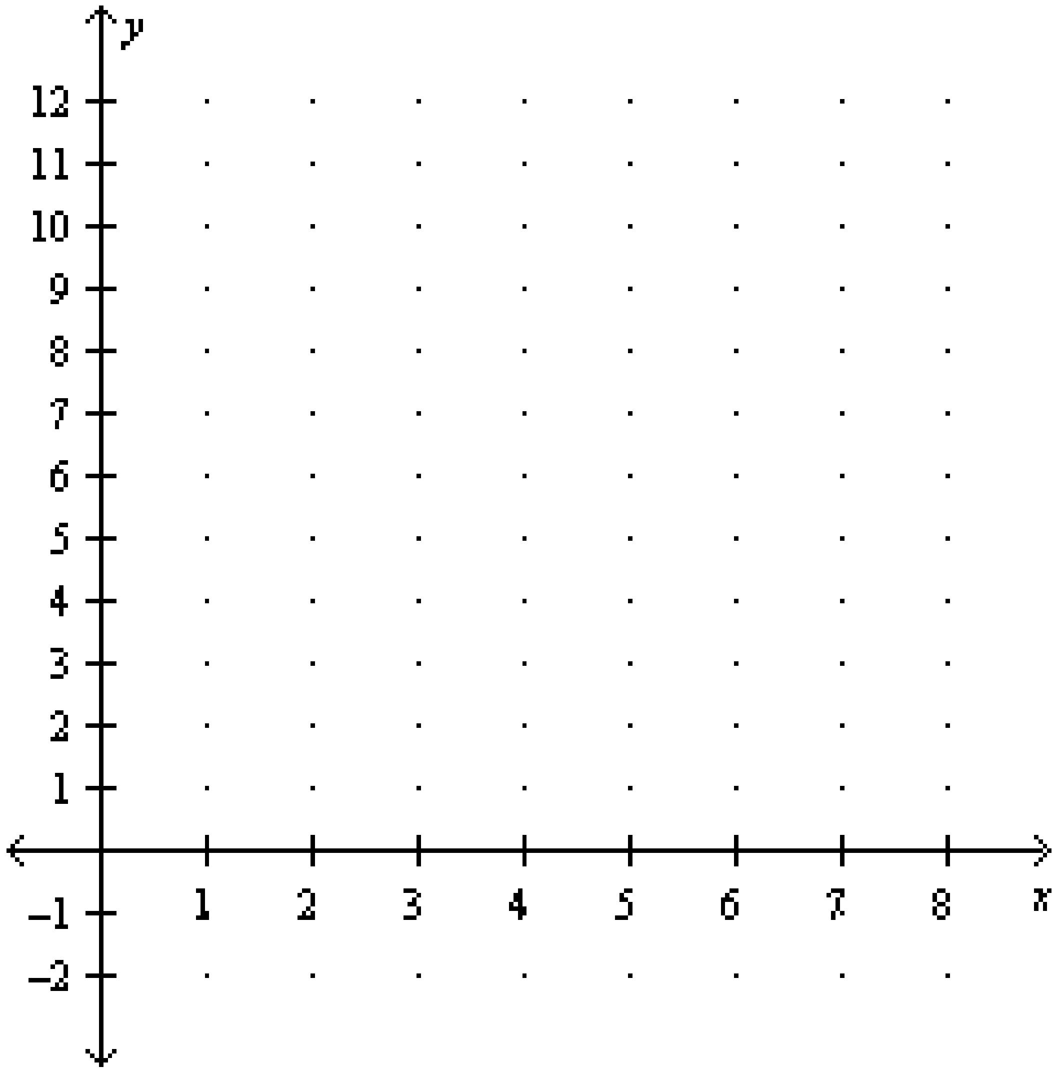
$$y = 6\left(\frac{1}{2}\right)^{x-3} - 2$$

parent function:

x	y

function:

x	y


y
12
11
10
9
8
7
6
5
4
3
2
1
−1
−2
1
2
3
4
5
6
7
8
x

Formula for calculating compound interest:

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

P = principal amount (initial investment)
r = annual interest rate (as a decimal)
n = number of times the interest is compounded per year
t = number of years
A = amount after time t

Let's say you have $1 and you are going to invest it at a rate of 100%. Look to see how compounding it at different number of times per year effects your money...

(annually) $A = P(1+\frac{1}{1})^{1\cdot 1} = 2$

(bi-annually) $A = 1(1+\frac{1}{2})^{2\cdot 1} = 2.25$

(quarterly) $A = 1(1+\frac{1}{4})^{4\cdot 1} = 2.44$

(monthly) $A = 1(1+\frac{1}{12})^{12\cdot 1} = 2.61$

(weekly) $A = 1(1+\frac{1}{52})^{52\cdot 1} = 2.69$

(daily) $A = 1(1+\frac{1}{365})^{365\cdot 1} = 2.714567482$

(hourly) $A = 1(1+\frac{1}{8760})^{8760\cdot 1} = 2.718126691$

(minutely) $A = 1(1+\frac{1}{525600})^{525600\cdot 1} = 2.718279215$

(secondly) $A = 1(1+\frac{1}{31536000})^{31536000\cdot 1} = 2.718282473$

This brings us to e. It is approximately equal to 2.71828.

Ex. 3: Use the graph of $y = e^x$ to evaluate each expression to four decimal places.

$a)\ e^4 =$ $\qquad$ $b)\ e^{-3} =$ $\qquad$ $c)\ e^{\frac{1}{2}} =$

Continuously Compounded Interest Formula:

$$A = Pe^{rt}$$

$A =$ amount in account

$P =$ principal

$r =$ annual rate of interest

$t =$ time in years

Ex. 4 : Suppose you invest $100 at an annual interest rate of 4.8% compunded continuously. How much will you have in the account after 3 years?

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