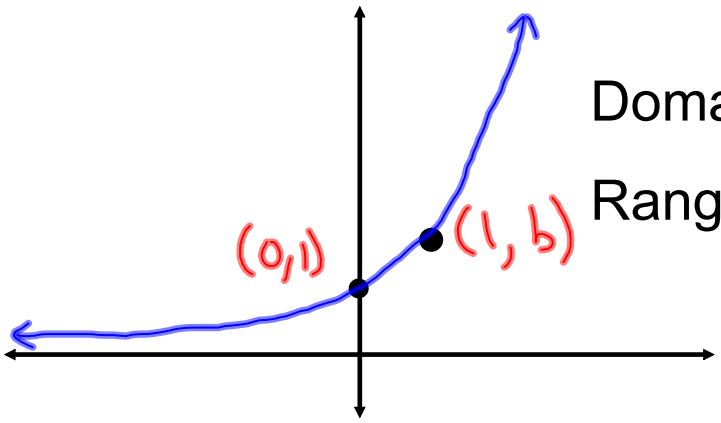
Chapter 7.1 Graph Exponential Growth Functions

Parent Function: $f(x) = b^x, b > 1$

x is the exponent



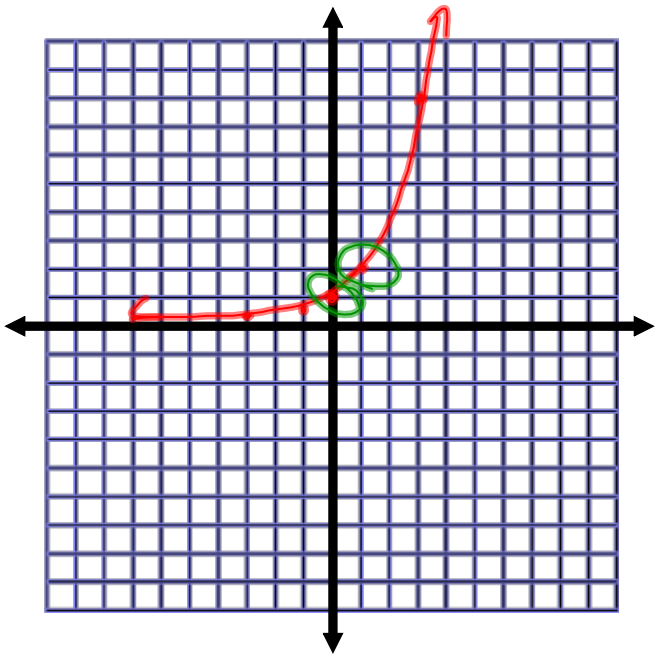
Domain: $x \in \mathbb{R}$

Range: $y > 0$

$$f(x) = a\,b^{(x-h)} + k$$

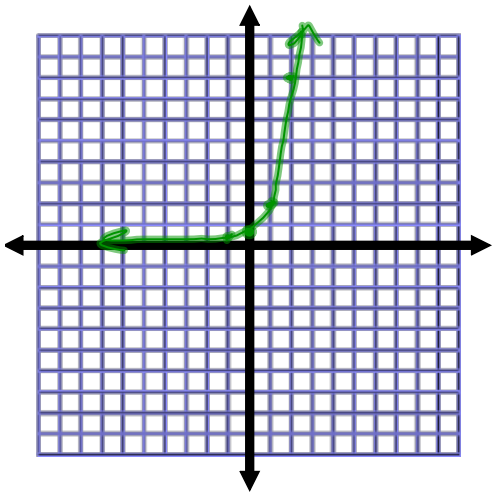
Graph: $y = 2^x$

x	y
-3	1/8
-1	1/2
0	1
1	2
3	8

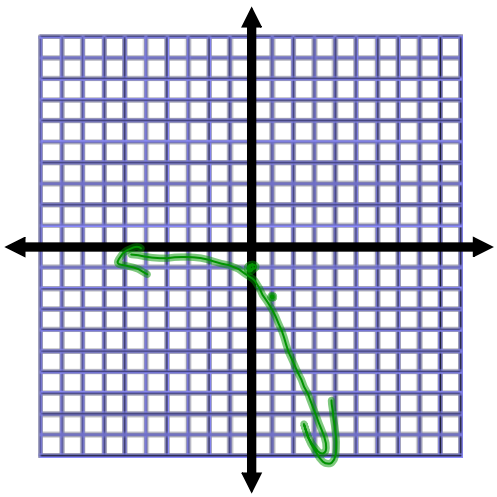


Graph:

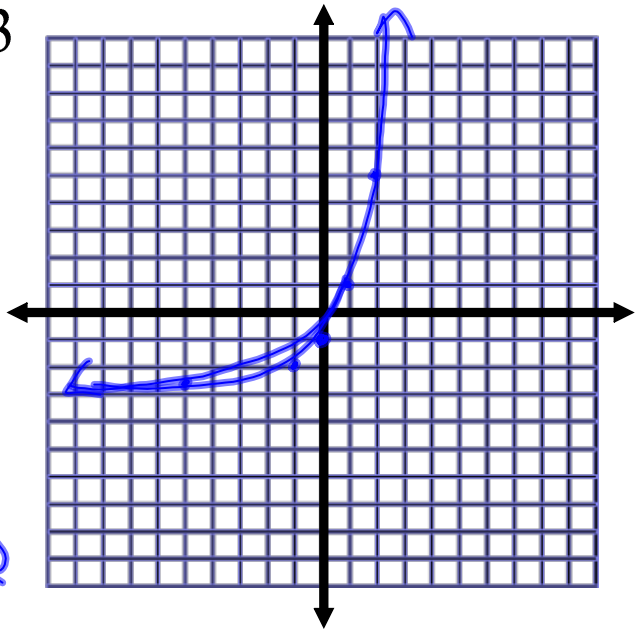
$y = \frac{1}{2} \bullet 4^x$



$y = -\left(\frac{5}{2}\right)^x$



Graph: $y = 4 \bullet 2^{x-1} - 3$



Domain: $x \in \mathbb{R}$

Range: $y > -3$

From PF:

stretch by 4

growth rate of 2

right 1

down 3

Exponential Growth Models

$$y = a(1+r)^t$$

a= initial amount

t= years

r= rate/%

1+r = growth rate

In 1996, there were 2573 computer viruses and other computer security incidents. During the next 7 years, the number of incidents increased by about 92% each year.

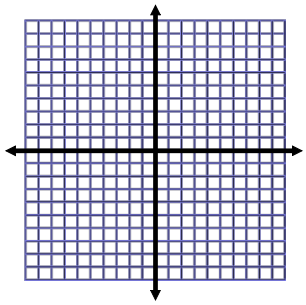
a. Write a model given n number of incidents t years after 1996. About how many were in 2003?

$y = a(1+r)^t$

$n = 2573(1.92)^t$

$n = 247{,}484$

b. Graph the model.



c. Use the graph to estimate the year when there were about 125,000 computer security incidents.

Compound Interset

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

A = amount

P = principle

r = annual rate

n = number of compounds per year

t = year

You deposit $4000 in an account that pays 2.92% annual interest. Find the balance after 1 year if the interest is compounded.....

a. quarterly

$A = 4000\left(1 + \frac{.0292}{4}\right)^{4(1)}$

$A = 4118.08$

b. daily

$A = 4000\left(1 + \frac{.0292}{365}\right)^{365(1)}$

$A = 4118.51$

Number of compounds per year

yearly= 1

semi annually= 2

quarterly = 4

monthly = 12

bi-monthly = 24

weekly = 52

daily= 365

Homework: Ch 7.1 pg. 482
#'s 4,8,14,16,22,24,38