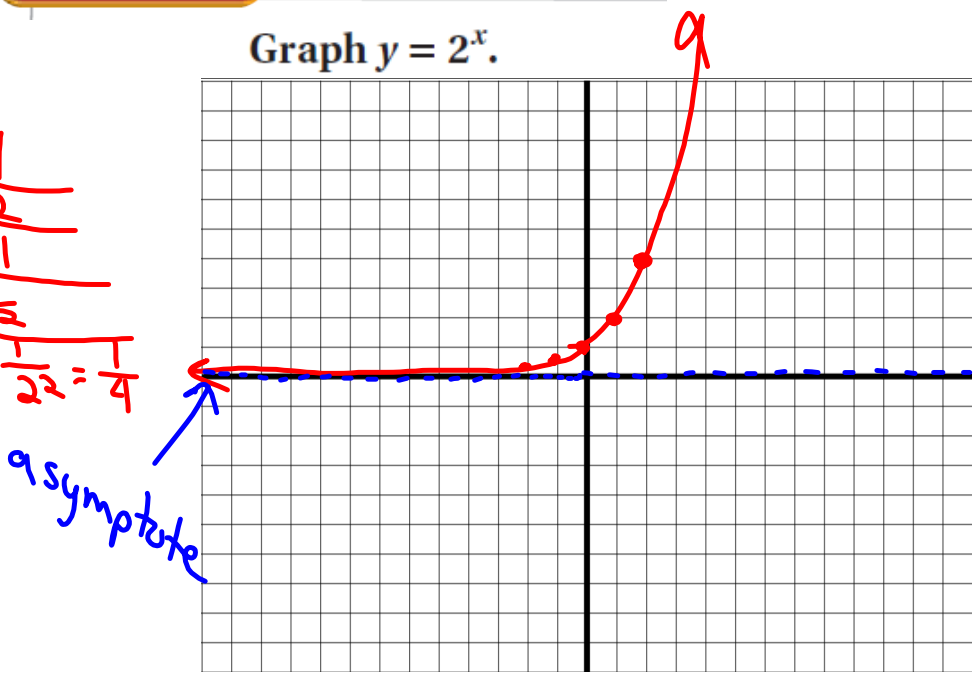
7.1 Graph Exponential Growth Functions

EXAMPLE 1 Graph $y = b^x$ for $b > 1$

Graph $y = 2^x$.

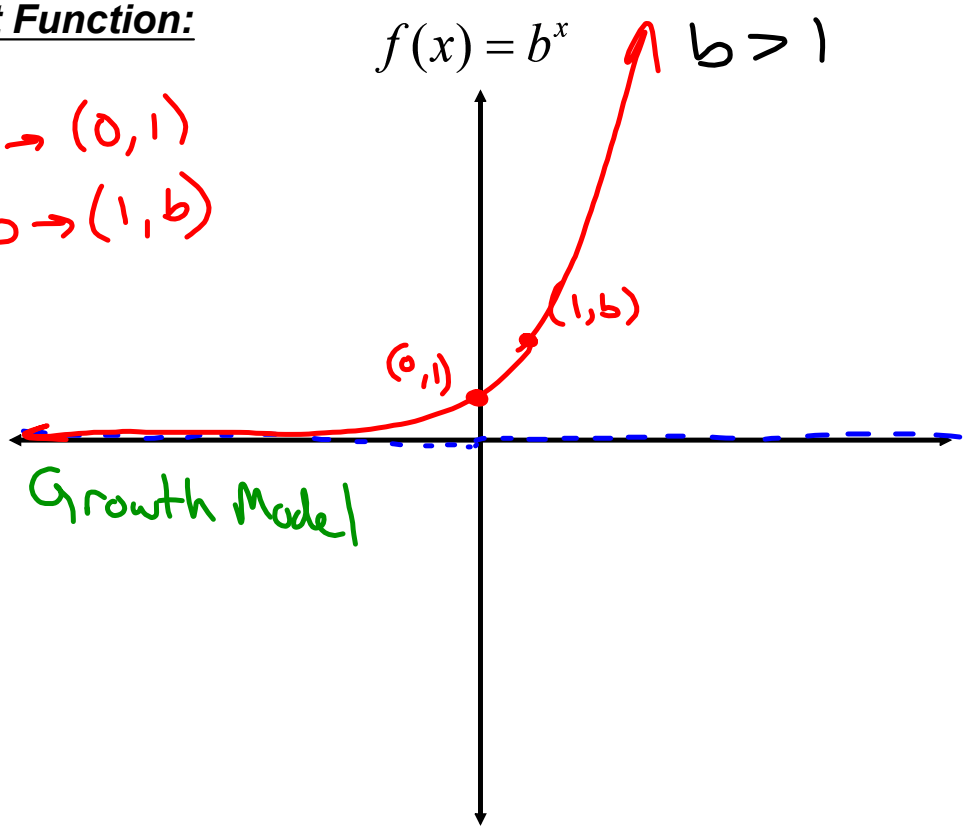
x	y
2	$2^2 = 4$
1	$2^1 = 2$
0	$2^0 = 1$
-1	$2^{-1} = \frac{1}{2}$
-2	$2^{-2} = \frac{1}{2^2} = \frac{1}{4}$



Parent Function:

$b^0 = 1 \rightarrow (0,1)$

$b^1 = b \rightarrow (1,b)$



EXAMPLE 2 **Graph $y = ab^x$ for $b > 1$**

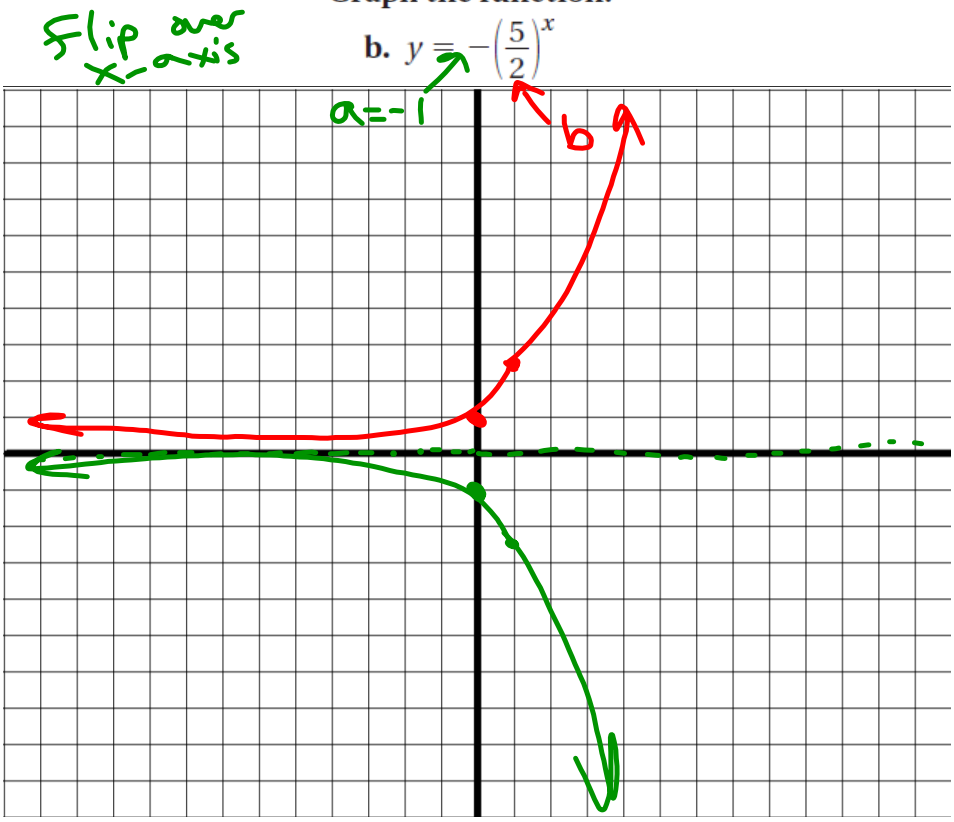
Graph the function.

a. $y = \frac{1}{2} \cdot 4^x$

EXAMPLE 2 **Graph $y = ab^x$ for $b > 1$**

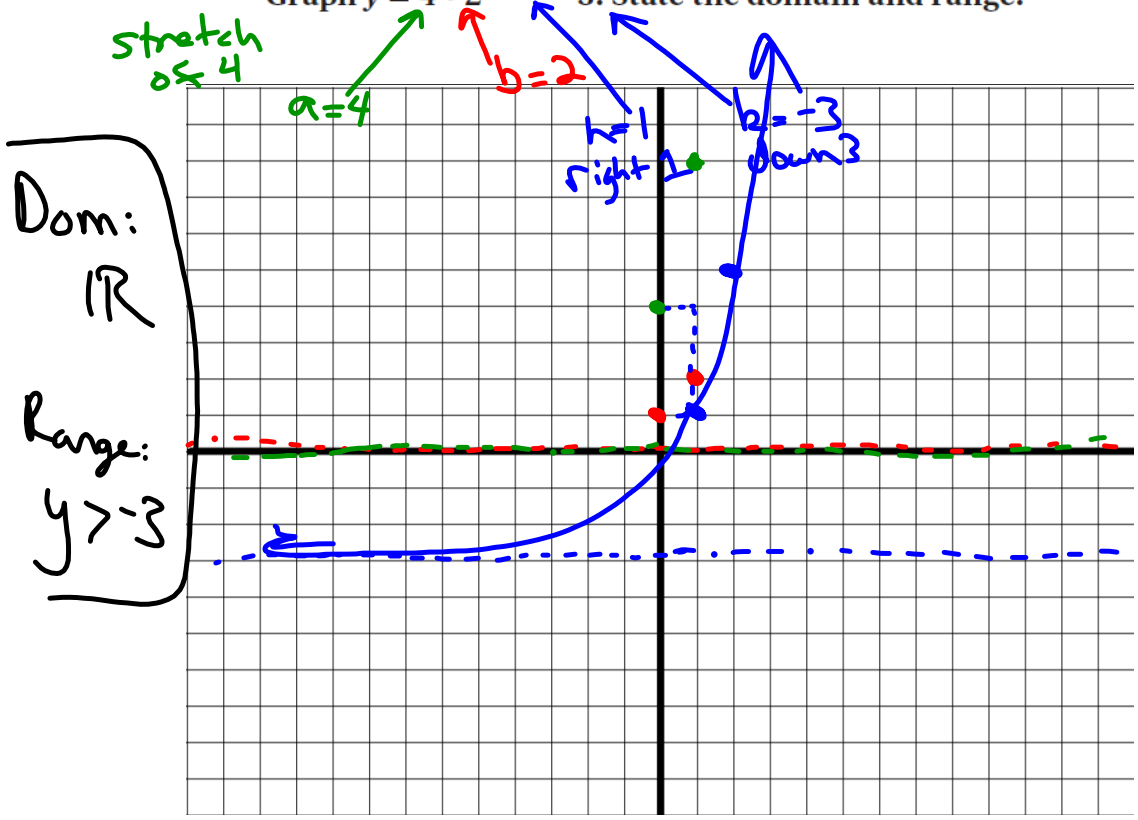
Graph the function.

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



EXAMPLE 3 Graph $y = ab^{x-h} + k$ for $b > 1$

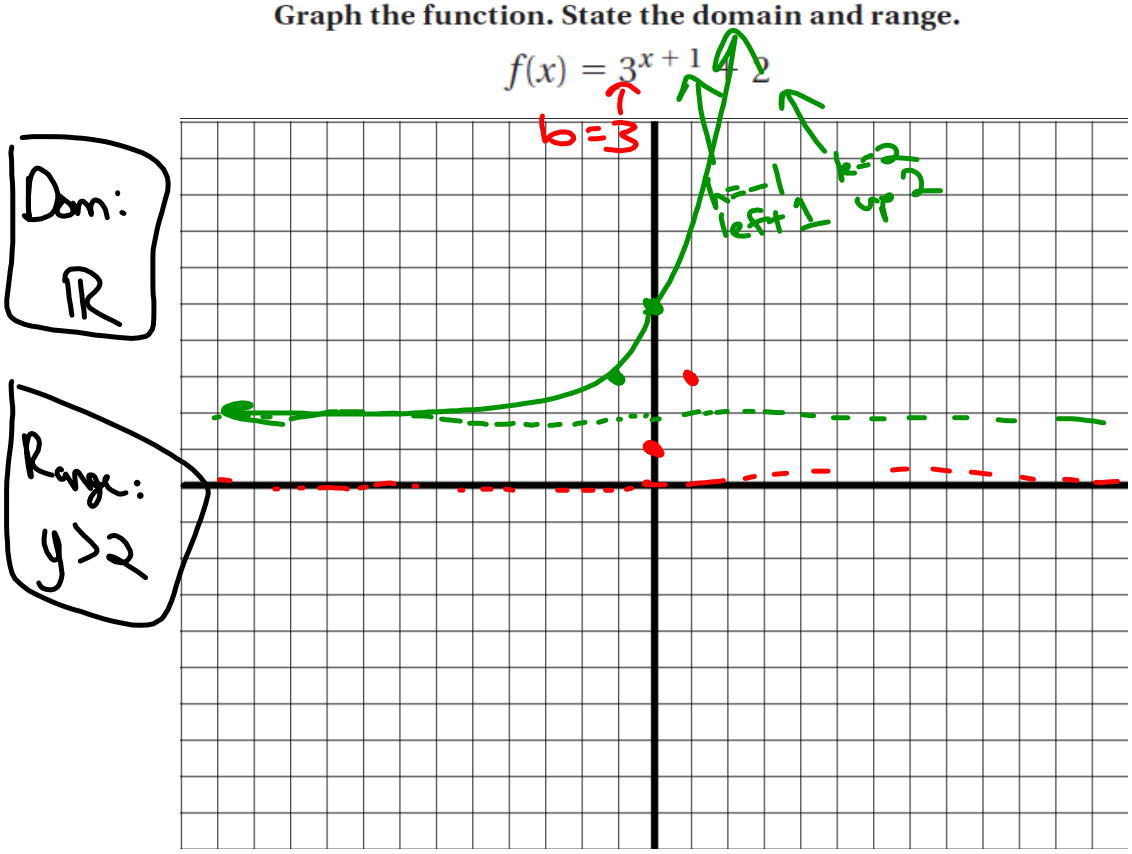
Graph $y = 4 \cdot 2^{x-1} - 3$. State the domain and range.



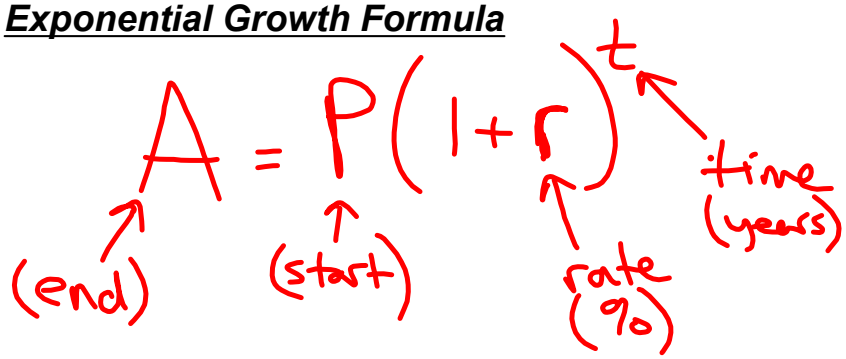
EXAMPLE 3 **Graph $y = ab^{x-h} + k$ for $b > 1$**

Graph the function. State the domain and range.

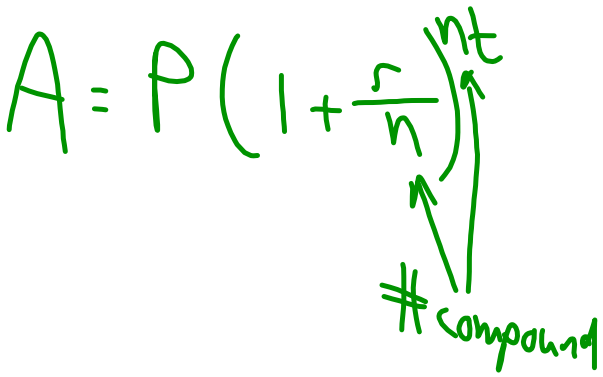
$$f(x) = 3^{x+1} + 2$$



Exponential Growth Formula



Compound Interest Formula



WRITING MODELS **In Exercises 28–30, write an exponential growth model that describes the situation.**

30. You purchase an antique table for \$450. The value of the table increases by 6% per year.

$$A = P(1+r)^t$$

$$A = 450(1+0.06)^t$$

$$A = 450(1.06)^t$$

EXAMPLE 5 Find the balance in an account

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

a. Quarterly

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

$A = 4000\left(1 + \frac{0.0292}{4}\right)^{(4\times1)}$

$= \$4118.09$

b. Daily

$A = 4000\left(1 + \frac{0.0292}{365}\right)^{(365\times1)}$

$= \$4118.52$