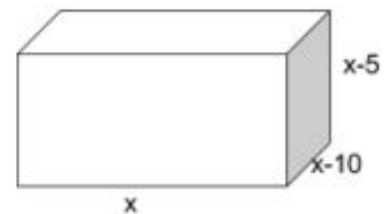


Sm3.A7.C - Properties of Logs	Name
Solve 1-6 WITHOUT using a calculator!	
1. Simplify: a. $\log_3 \frac{1}{27}$ b. $\log_4 \frac{1}{4}$	2. Solve for x: $\log_4 8x = 3$
3. Solve for x: $\ln(2x) = 0$	4. Simplify: a. $\log_3 9 =$ b. $\log_9 1$
5. Simplify: a. $3\log_2 2$ b. $\ln(e)$	6. Solve for x: $\frac{1}{2}\log_5 x - 5 = -2$
7. Find all the solutions of the equation on $0 < x < 360^\circ$ and $0 < x < 2\pi$. $2\sin^2 x = 1$	8. Change the following to Log form, and then use change of base to find the exponent. $5^x = 240$

3. The aquarium shown at the right holds 750 cubic feet of water. What are the dimensions (L, W, H in feet) of the aquarium?



9. Graph $f(x)$, $f^{-1}(x)$, and $y=x$

$$f(x) = 2^x$$

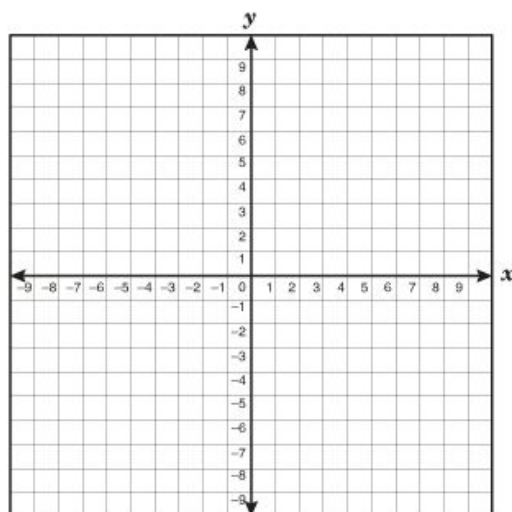
y-Intercept (,)

Asymptote Eq.

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

x-Intercept (,)

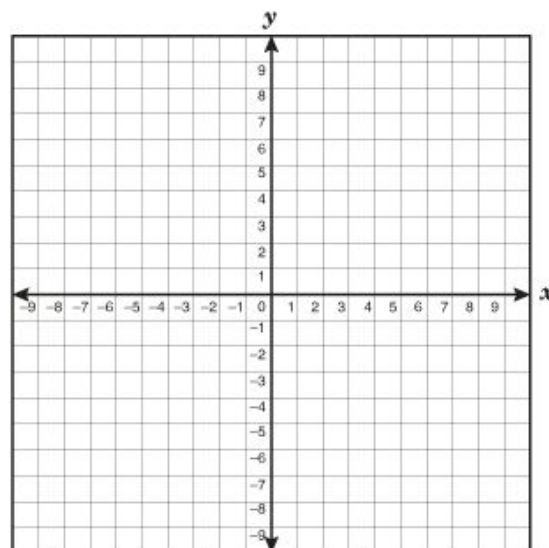
Asymptote Eq.



10. Sketch and label the graph of the equations.
List the asymptote and state the transformations.

a. $y = 2^{x-1}$

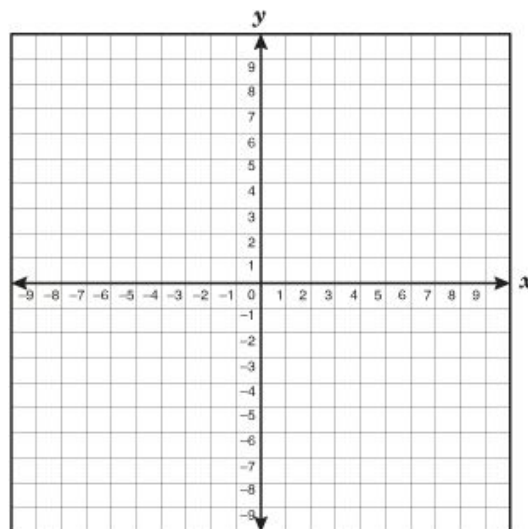
b. $y = 2^x + 5$



11. Sketch and label the graph of the equations.
List the asymptote and state the transformations.

a. $y = \log_2 x - 3$

b. $y = \log_2(x + 5)$



12. Graph $f(x)$, $f^{-1}(x)$, and $y=x$

$$f(x) = 5^x$$

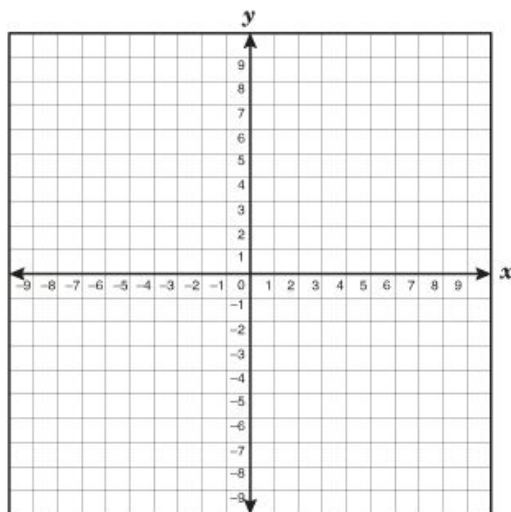
y-Intercept (,)

Asymptote Eq.

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

x-Intercept (,)

Asymptote Eq.



13. Sketch and label the graph of the equations. List the asymptote and state the transformations.

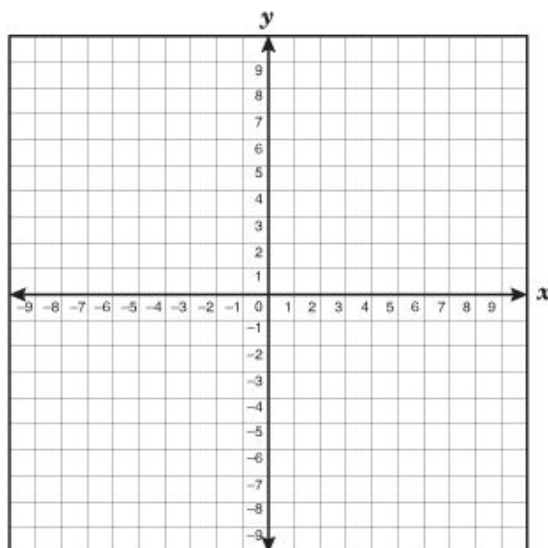
$$y = 5^{x+3} - 4$$

DOMAIN:

RANGE

Asymptote:

Transformations:



14. Sketch and label the graph of the equations. List the asymptote and and state the transformations.

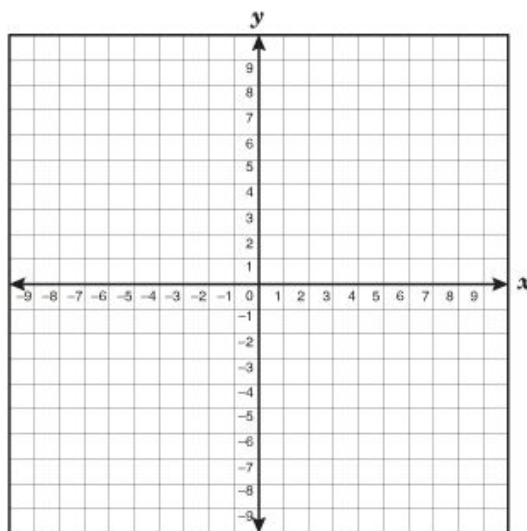
$$y = \log_5(x - 2) + 1$$

DOMAIN:

RANGE

Asymptote:

Transformations:



15. Change the following to Log form, and then use change of base to find the exponent.

$$3^x = 45$$

16. Change the following to Log form, and then use change of base to find the exponent.

$$2^x = 120$$

17. In Jan 2015, Africa has a population of you 500 elephants. HALF are dying each year.

Equation?

What if Half are dying every 5 years?

How many will there be in 7 years with the second situation?

Find when there will be 100 elephants.
(Use a table, graph or some other method.)

18. In 2000, North America has 315 million people. It is increasing by 1.5% every year. Equation? :

Find the **year** there will be 388,000,000 people. (Use a table, graph or some other method.)

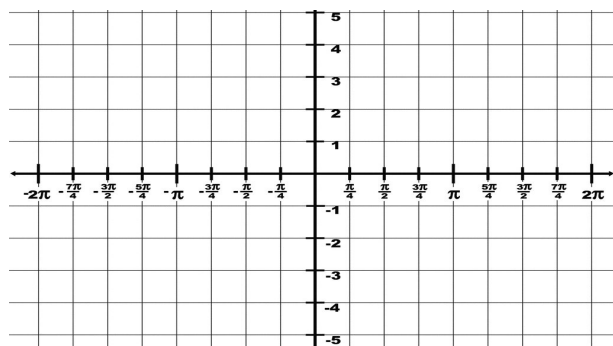
19. Write an equation that matches the following table:

time	Amount
0	9
0.25	18
0.5	36
0.75	72
1	144
1.25	288

20. Using synthetic division, find the value of a that would make $x-5$ a factor of $f(x) = x^3 - 4x^2 - 17x + a$

21 Using the following situation, Create an equation that has half the amplitude and is going twice as fast. Sketch the graph.

$$y = 8\cos(x)$$



22. Decide if the equation represents exponential growth or exponential decay. Then find the initial amount (y-intercept).

A. $y = 12 \cdot \left(\frac{8}{10}\right)^x$
y-Intercept (,)

B. $f(x) = 3 \cdot \frac{13^x}{6}$
y-Intercept (,)

