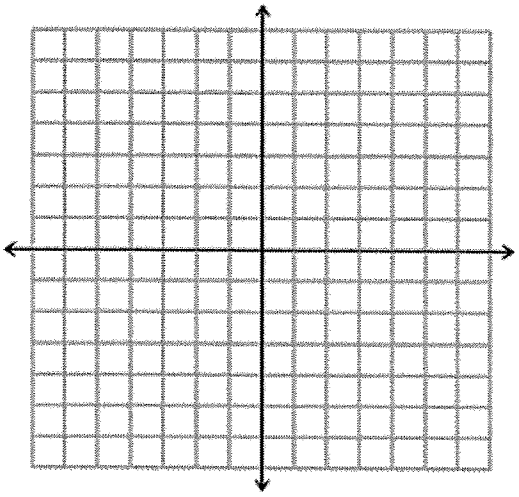
Graphing Exponential Functions Name_____

Graph $y = 2^x$. Label any intercepts and asymptotes.



D: _____

R: _____

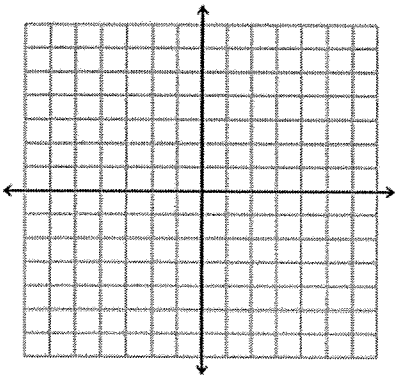
y-int: _____

asymptote: _____

Increasing or Decreasing ?

1. Compare the following graphs to $y = 2^x$. Label the asymptote, y-intercept, and one additional point for each graph.

$y = \frac{1}{3} \cdot 2^x$

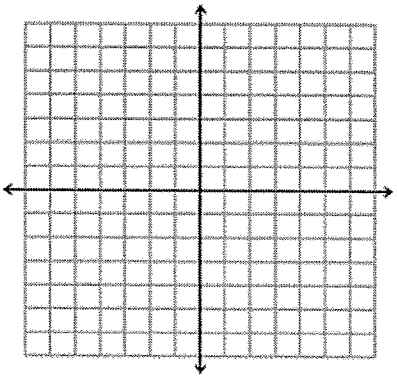


A: _____

(0,)

(,)

$y = 3 \cdot 2^x$

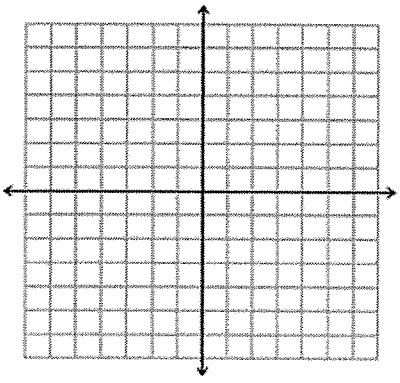


A: _____

(0,)

(,)

$y = -\frac{1}{3} \cdot 2^x$

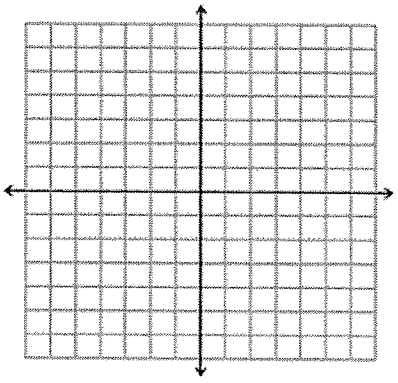


A: _____

(0,)

(,)

$y = -3 \cdot 2^x$



A: _____

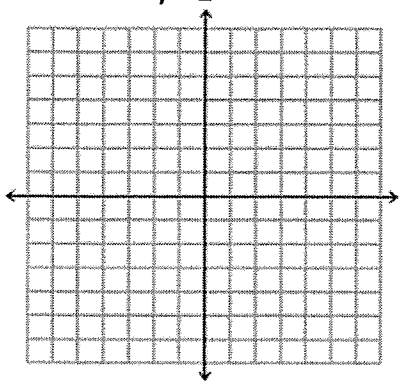
(0,)

(,)

Describe the effect of a on the graph of $y = a \cdot 2^x$.

2. Compare the following graphs to $y = 2^x$. Label the asymptote, y-intercept, and one additional point for each graph.

$y = 2^{x+1}$

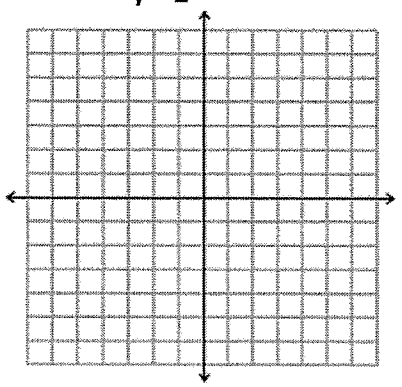


A: _____

(0,)

(,)

$y = 2^{x+2}$

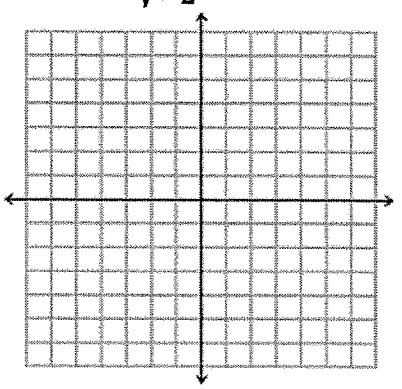


A: _____

(0,)

(,)

$y = 2^{x-2}$



A: _____

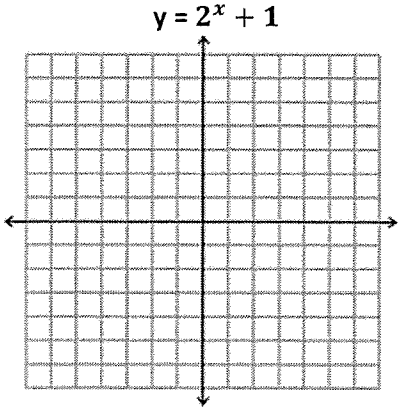
(0,)

(,)

Describe the effect of h on the graph of $y = 2^{x-h}$.

3. Compare the following graphs to $y = 2^x$. Label the asymptote, y-intercept, and one additional point for each graph.

$y = 2^x + 1$

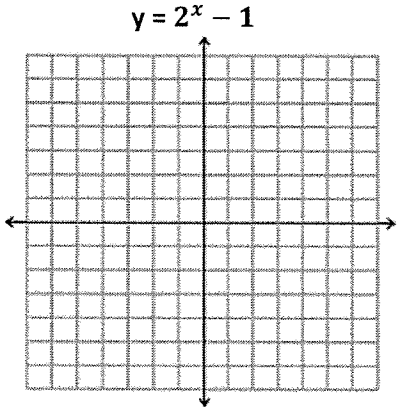


A: _____

(0,)

(,)

$y = 2^x - 1$

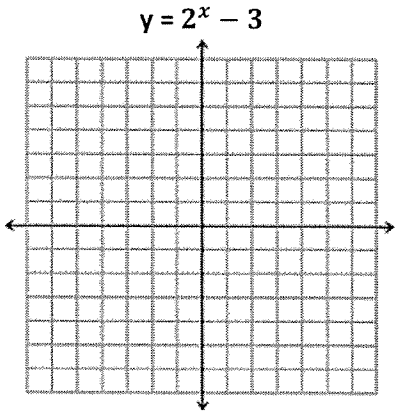


A: _____

(0,)

(,)

$y = 2^x - 3$



A: _____

(0,)

(,)

Describe the effect of k on the graph of $y = 2^x + k$.

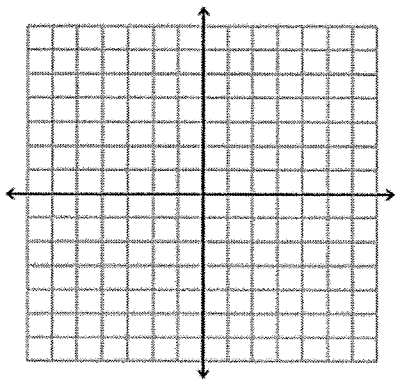
4. Graph each of the following. Label the asymptote, y-intercept, and one additional point for each graph.

$y = 2^x$

A: _____

(0,)

(,)

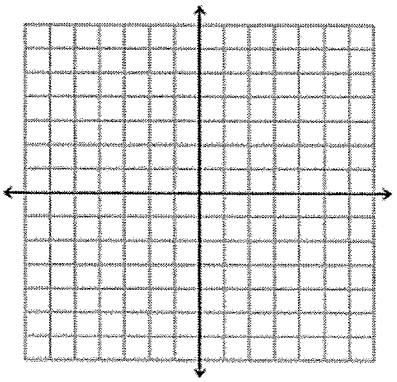


$y = 5^x$

A: _____

(0,)

(,)

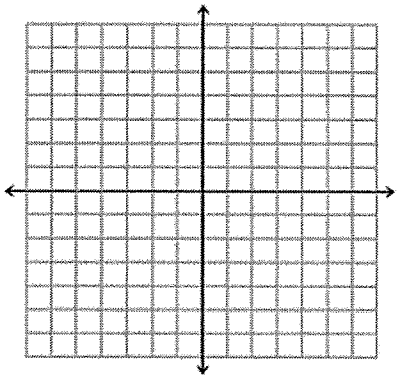


$y = \left(\frac{1}{2}\right)^x$

A: _____

(0,)

(,)

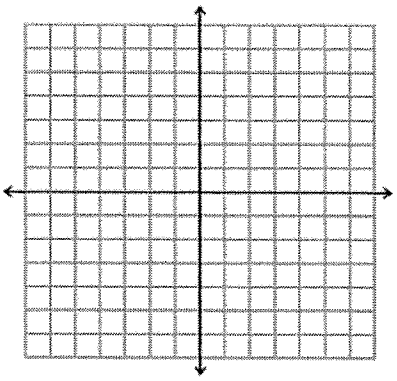


$y = \left(\frac{1}{5}\right)^x$

A: _____

(0,)

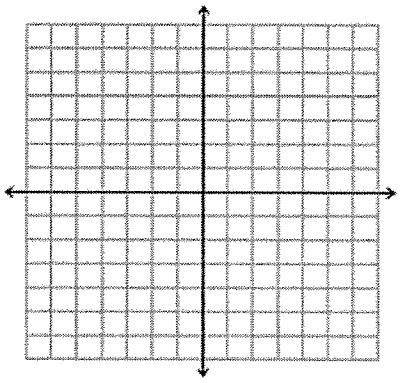
(,)



Describe the graph of y = b^x when $b > 1$ and when 0 < b < 1 (increasing/decreasing?). What point do all of the graphs have in common?

5. Compare the following graph to y = 2^x. Label the asymptote, y-intercept, and one additional point.

$y = 2^{-x}$



How do the graphs of y = 2^x and y = 2^{-x} compare?

6. Describe the transformations of each function from the parent graph of $y = 2^x$ then sketch each graph without a graphing calculator. Find the domain, range, y-intercept, and asymptote.

a) $y = 2^{x+4} - 15$

Transformations:

D: _____

R: _____

y-int: _____

asymptote: _____

Increasing or Decreasing ?

b) $y = -3(2^x) + 5$

Transformations:

D: _____

R: _____

y-int: _____

asymptote: _____

Increasing or Decreasing ?