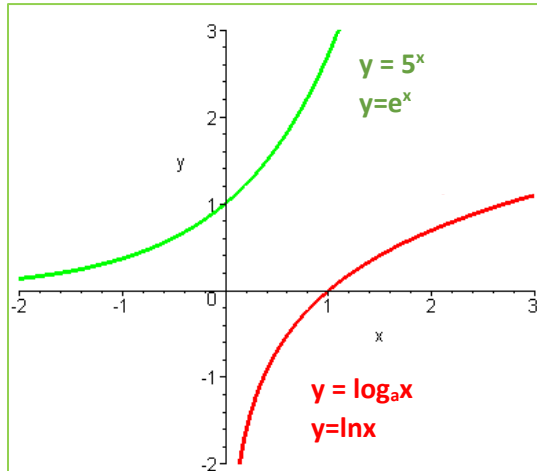




$$D: (-\infty, \infty) \quad R: (0, \infty)$$

$$D: (0, \infty) \quad R: (-\infty, \infty)$$

*Inverse of each other

$$\text{Log}_e x = \ln x$$

$$\text{Log}_b A = e \leftrightarrow b^e = A$$

$$\ln A = x \leftrightarrow e^x = A$$

b is base, e is exponent, A is answer

EXAMPLE: $\ln(x+4)$ inverse: $e^x - 4$ *left to down

EXAMPLE: $\ln x + 4$ inverse: e^{x-4} *up to right

Horizontal and vertical shifts switch and change the sign

*D and R switch.

- 1) Use the given function f to answer parts (a) th

$$f(x) = \ln(x - 3)$$

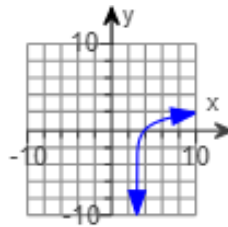
- (a) Find the domain of f .

The domain of f is $(3, \infty)$.

(Type your answer in interval notation.)

- (b) Graph f . Choose the correct graph below.

Right 3



- (c) From the graph, determine the range and an

The range of f is $(-\infty, \infty)$.

(Type your answer in interval notation.)

Determine the vertical asymptote of f . Select the answer box to complete your choice.

- ☒ A. The vertical asymptote of f is $x = 3$.

- (d) Find f^{-1} , the inverse of f .

$$f^{-1}(x) = e^x + 3 \quad (\text{Simplify your answer.})$$

- (e) Find the domain and range of f^{-1} .

The domain of f^{-1} is $(-\infty, \infty)$.

(Type your answer in interval notation.)

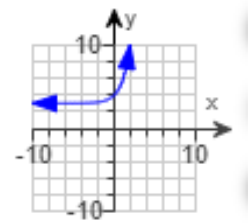
The range of f^{-1} is $(3, \infty)$.

(Type your answer in interval notation.)

- (f) Graph f^{-1} . Choos

Up 3

☒ A.



- 2) Begin with the graph of $y = e^x$. Use transformations to graph the function below. Then determine its domain, range, and horizontal asymptote.

$$f(x) = 9 - e^{-x}$$

Check reflection for both FIRST

What is the domain of $f(x) = 9 - e^{-x}$?

$(-\infty, \infty)$

(Type your answer in interval notation.)

What is the range of $f(x) = 9 - e^{-x}$?

$(-\infty, 9)$

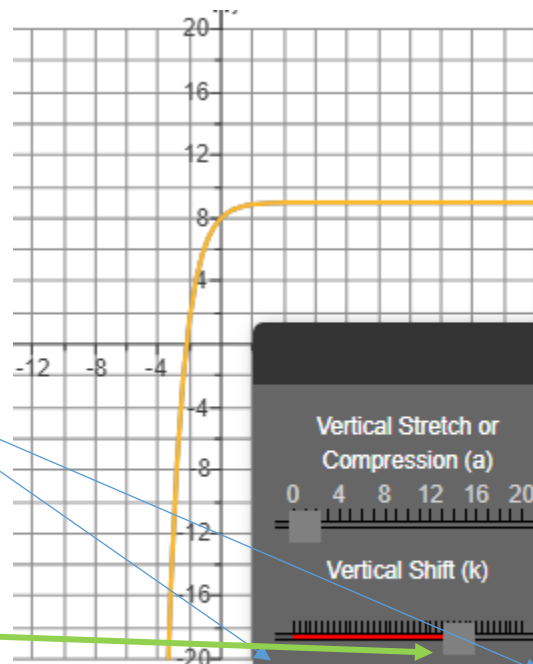
(Type your answer in interval notation.)

What is the horizontal asymptote of

$$f(x) = 9 - e^{-x}?$$

$$y = 9$$

Up 9



Vertical Stretch or Compression (a)

0 4 8 12 16 20

Horizontal Stretch or Compression (a)

0 4 8 12 16 20

Vertical Shift (k)

0 4 8 12 16 20

Horizontal Shift (h)

0 4 8 12 16 20

☒ Reflect over x-axis

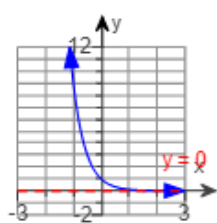
☒ Reflect over y-axis

Base

e

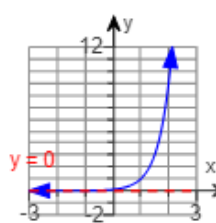
- 3) reflect y down 1 reflect x & y reflect x, up 1

37.



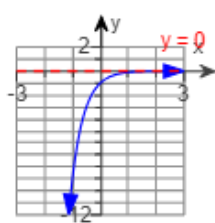
$$y = 9^{-x}$$

38.



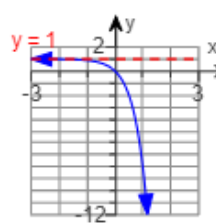
$$y = 9^{x-1}$$

39.



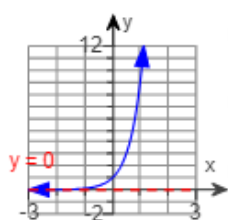
$$y = -9^{-x}$$

40.



$$y = 1 - 9^x$$

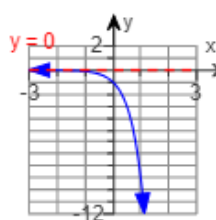
41.



$$y = 9^x$$

no change

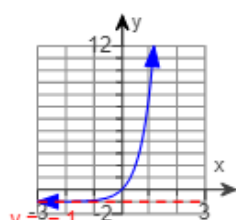
42.



$$y = -9^x$$

reflect x

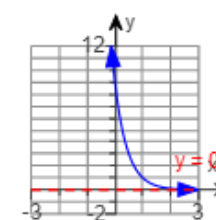
43.



$$y = 9^x - 1$$

down 1

44.



$$y = 9^{1-x}$$

reflect y, left 1

- 4) Solve the equation.

$$\left(\frac{2}{5}\right)^x = \left(\frac{8}{125}\right) \quad 2^3 = 8 \text{ and } 5^2 = 125 \text{ then } x = 3$$

- 5) Determine whether the function given by the table is linear, exponential, or neither. If the function is linear, find a linear function that models the data; if it is exponential, find an exponential function that models the data.

x	f(x)
-1	$\frac{1}{6}$
0	1
1	6
2	36
3	216



The function is exponential. An exponential function that models the data is $f(x) = 6^x$
(Simplify your answer.)

- 6) Change the logarithmic statement to an equivalent statement involving an exponent.

$$\log_a 3 = 5$$

The equivalent exponential statement is $a^5 = 3$. (Type an equation.)

7) Find the domain of the function.

$$h(x) = 6 - 8 \log_5 \left[\frac{x}{8} - 2 \right] \quad \text{only solve inside []}$$

$$\frac{x}{8} - 2 = 0 \quad x = 16$$

The domain of h is $(16, \infty)$.

(Type your answer in interval notation.)

8) Use transformations to graph the function. Determine the domain, range, horizontal asymptote, and y-intercept of the function.

$$f(x) = 3^{-x} - 4$$

What is the domain of $f(x) = 3^{-x} - 4$?

$$(-\infty, \infty)$$

(Type your answer in interval notation.)

What is the range of $f(x) = 3^{-x} - 4$?

$$(-4, \infty)$$

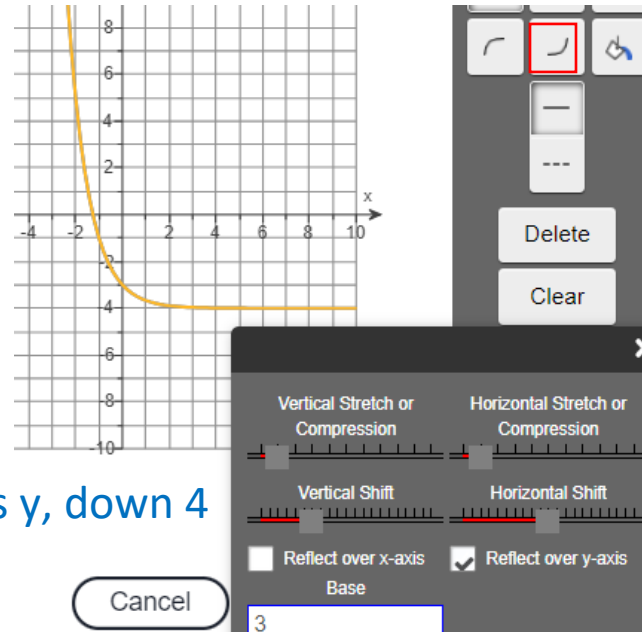
(Type your answer in interval notation.)

Determine the horizontal asymptote of $f(x) = 3^{-x} - 4$. Select the correct choice below and, if necessary, fill in the answer box(es) to complete your choice.

☒ B. The function has one horizontal asymptote, $y = -4$.
(Type an equation.)

What is the y-intercept of $f(x) = 3^{-x} - 4$?

3 (Type an integer or a simplified fraction.)



reflect across y, down 4

$$b^0 = 1$$

$$x^{-1} = \frac{1}{x}$$

$$x^{1/2} = \sqrt{x}$$

9) Find the exact value of the logarithm without using a calculator.

$$\log_{1/2} 512 \quad \frac{1}{2}^x = 512 \quad 2^9 = 512 \quad x = -9$$

$\frac{1}{2}$ to 2 is negative exponent

10) Solve the equation.

$$\log_x 9 = 2 \quad x^2 = 9 \quad x = 3$$

- 11) Use transformations to graph the function. Determine the domain, range, horizontal asymptote, and y-intercept of the function.

$$f(x) = 4 + 3^{x-2}$$

What is the domain of $f(x) = 4 + 3^{x-2}$?

$(-\infty, \infty)$

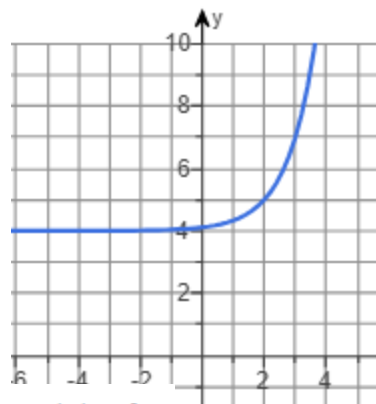
(Type your answer in interval notation.)

What is the range of $f(x) = 4 + 3^{x-2}$?

$(4, \infty)$

(Type your answer in interval notation.)

Right 2, up 4



Determine the horizontal asymptote of $f(x) = 4 + 3^{x-2}$. Select the correct choice below and, if necessary, fill in the answer box(es) to complete your choice.

- ☒ A. The function has one horizontal asymptote, $y = 4$.
(Type an equation.)

- 12) Determine whether the function given by the table is linear, exponential, or neither. If the function is linear, find a linear function that models the data; if it is exponential, find an exponential function that models the data.

x	f(x)
-1	$\frac{9}{8}$
0	9
1	72
2	576
3	4608

- ☒ B. The function is exponential. An exponential function that models the data is $f(x) = 9 \cdot 8^x$.
(Simplify your answer.)