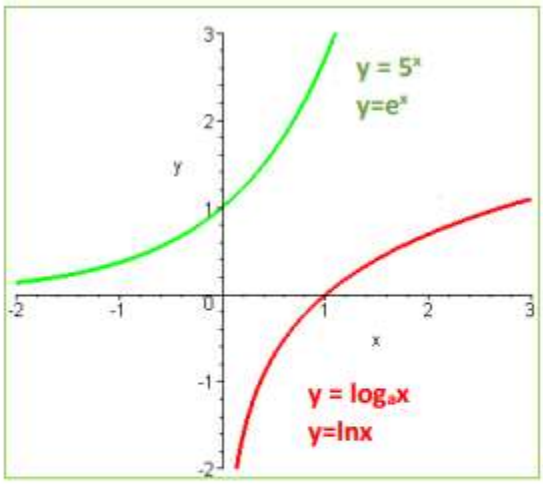
7.3 Logarithmic Functions as Inverses Algebra 2 THOMPSON



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

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*Inverse of each other

$\log_e x = \ln x$

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

b is base, e is exponent, A is answer

1) Write in logarithmic form.

$81 = 3^4$

$\log_3 81=4$

2) Write in logarithmic form.

$64 = 4^3$

$\log_4 64=3$

3) Find the value of the logarithmic expression.

$\log_5 125$

$\log_5 125=x$ then write in exponential form: $5^x = 125$

$x = 3$

4) Find the value of the logarithmic expression.

$\log_3 81$

$\log_3 81=x$ then write in exponential form: $3^x = 81$

$x = 4$

5) Write in logarithmic form.

$625 = 5^4$

$\log_5 625=4$

$b^0 = 1$ $x^{-1} = \frac{1}{x}$ $x^{1/2} = \sqrt{x}$

6) Write in logarithmic form.

$\frac{1}{8} = 2^{-3}$

2 is the base, -3 is exponent, $\frac{1}{8}$ is answer, negative exponent make a fraction

$\log_b A = e$ $\log_2 \frac{1}{8} = -3$

7) Write in logarithmic form.

$0.0001 = 10^{-4}$

Choose the correct logarithmic form below.

- $10 = \log_{-4} 0.0001$
- $0.0001 = \log_{10} -4$
- $-4 = \log_{0.0001} 10$
- ✔ $-4 = \log_{10} 0.0001$

8) Evaluate the following logarithm. $\log_9 3=x$ then write in exponential form: $9^x = 3$

$\log_9 3$

$x^{1/2} = \sqrt{x}$ $x = ½$

9) Find the value of the logarithmic expression.

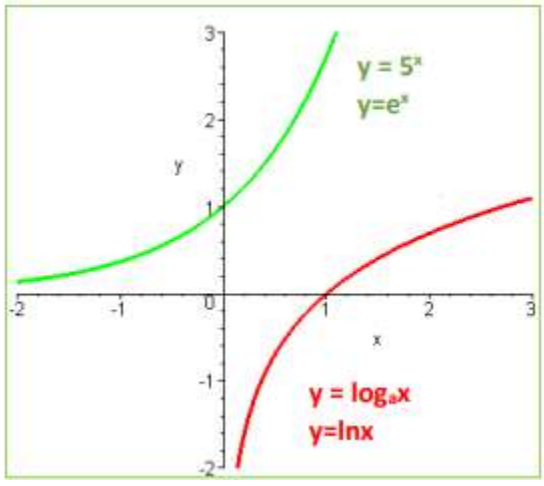
$\log_4 64$ $\log_4 64=x$ then write in exponential form: $4^x = 64$

$x = 3$

10) Find the value of the logarithmic expression.

$\log_2 32$ $\log_2 32=x$ then write in exponential form: $2^x = 32$

$x = 5$



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

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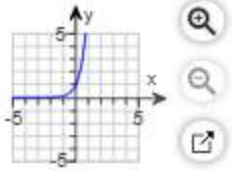
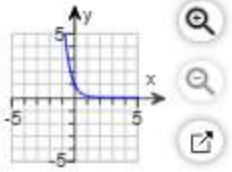
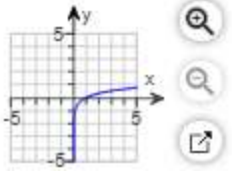
11) Graph the following function.

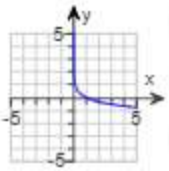
$y = \log_8 x$

Choose the correct graph below.

A. 

B. 

C. 

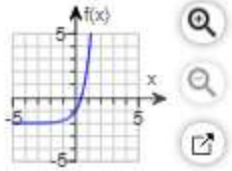
D. 

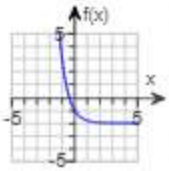
12) How does the graph of the following function compare with the graph of the parent function, $y = \log_b x$.

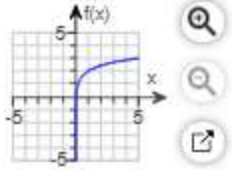
$y = \log_5 x + 2$

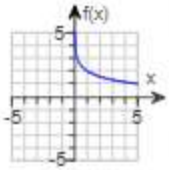
Choose the correct graph to the right.

This graph is the same as the parent graph except that it is shifted 2 units up .

A. 

B. 

C. 

D. 

13) Write as an exponential equation.

$\log_3 9 = 2$

$3^2 = 9$

14) Write in exponential form.

$-2 = \log_4 \frac{1}{16}$

$4^{-2} = \frac{1}{16}$