MAT 171 Homework Section 4.1: Exponential Functions

Approximate each number using a calculator. Round your answer to three decimal places.

1) $2^{3.4}$

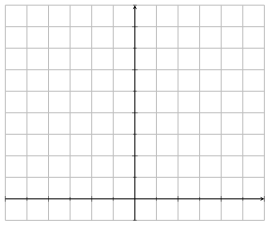
2) $4^{-1.5}$

3) $e^{2.3}$

4) $e^{-0.95}$

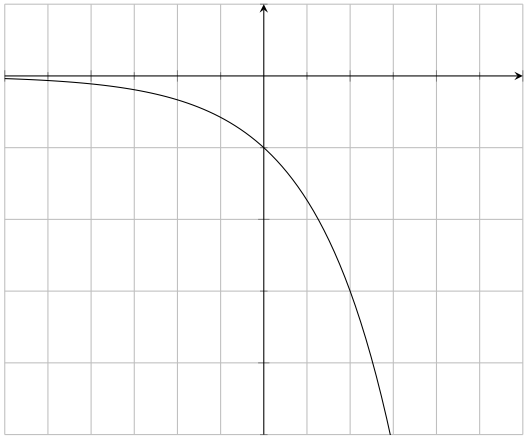
5) Graph the function by making a table of values, then sketch the graph of the function.

a) $f(x) = 4^x$

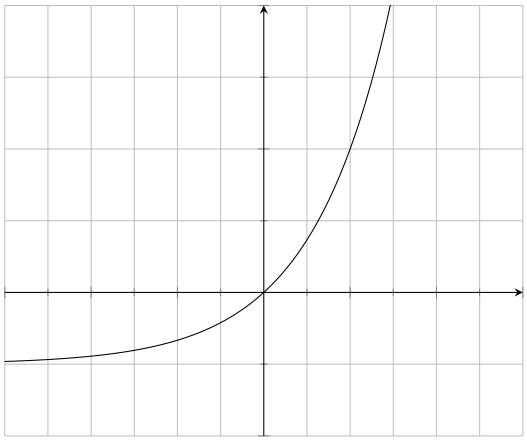


The graph of an exponential function is given, where the parent function is $f(x) = 3^x$. State the transformation(s) and write the equation of the function.

6)

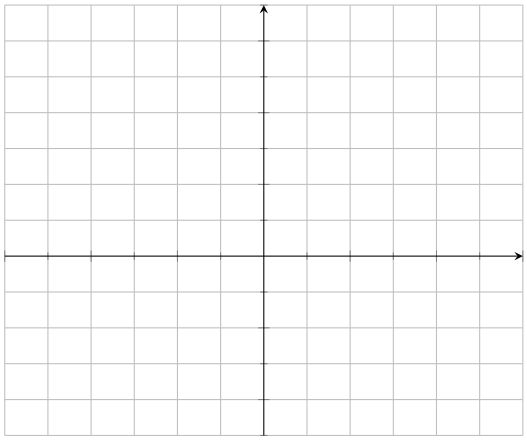


7)

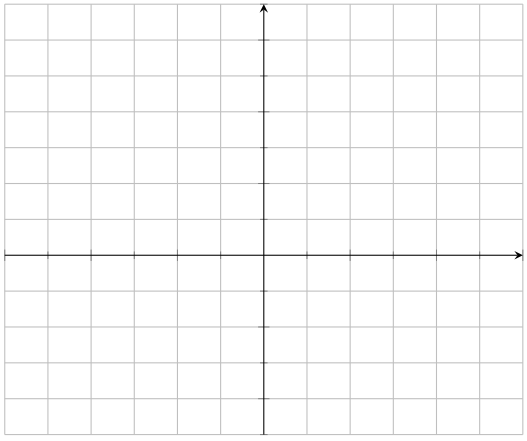


Use the graph of f to describe the transformation that yields the graph of h and draw a sketch. Give the equation of the asymptotes, and state the domain and the range of h.

8) $f(x) = 2^x$ $\qquad$ $h(x) = 2^{x+1} - 1$



9) $f(x) = e^x$ $\qquad$ $h(x) = e^{x+1} + 2$



10) Find the accumulated value of an investment of $5,000 for 10 years at an interest rate of 6.5% if the money is

a) Compounded semiannually

b) Compounded quarterly

c) Compounded monthly

d) Compounded continuously

11) Suppose that you have $12,000 to invest. Which investment yields the greater return over 3 years: 7% compounded monthly or 6.85% compounded continuously?

12) The formula $S = C(1 + r)^t$ models inflation, where C = the value today, r = annual inflation rate, and S = the inflated value t years from now. If the inflation rate is 6%, how much will a house now worth \$465,000 be worth in 10 years?

13) In college, we study large volumes of information - information that, unfortunately, we do not often retain for very long. The function $f(x) = 80e^{-0.5x} + 20$ describes the percentage of information, $f(x)$, that a particular person remembers x weeks after learning the information.

a) Substitute 0 for x and, without using a calculator, find the percentage of information remembered at the moment it is first learned.

b) Substitute 1 for x and find the percentage of information that is remembered after 1 week.

c) Find the percentage of information that is remembered after 4 weeks.

d) Find the percentage of information that is remembered after 1 year (52 weeks).