Chapter 5
ALL PROBLEMS MUST BE DONE ON SEPARATE PAPER OTHERWISE; THE REVIEW WILL NOT BE GRADED.
SHOW ALL WORK FOR CREDIT.   REVIEW IS DUE ON TEST DAY.

Use transformations to graph the function.   Determine the domain, range, and horizontal asymptote of the function.

1) $f(x) = 4^{(x+4)} - 1$

2) $f(x) = 5^{-x} + 2$

Solve the equation. 3) $4^{7-3x} = \dfrac{1}{16}$

Graph the function. 4) $f(x) = 2 - e^{-x}$

Solve the equation.

5) $3^{-x} = \dfrac{1}{81}$

6) $4^{x-1} = 32^{3x}$

7) $27^{4x+3} = 9^{5x}$

Change the exponential expression to an equivalent expression involving a logarithm. 8) $7^3 = 343$

Change the logarithmic expression to an equivalent expression involving an exponent. 9) $log_2 \dfrac{1}{8} = -3$

Find the exact value of the logarithmic expression.   10) $log_3 9$

11) $log_4 \dfrac{1}{64}$

Find the domain of the function.   12) $f(x) = log(x + 4)$

Graph the function. 13) $f(x) = log_4(x + 1)$

Solve the equation

14) $log_8(x^2 - 7x) = 1$

Use the properties of logarithms to find the exact value of the expression. Do not use a calculator.   15) $log_9 9^{16}$

Write as the sum and/or difference of logarithms. Express powers as factors.   16) $log_2 \left(\dfrac{x^3}{y^7}\right)$

Express as a single logarithm.   17) $2log_b q - log_b r$

Use the Change-of-Base Formula and a calculator to evaluate the logarithm. Round your answer to three decimal places.
18) $log_8 78.71$

Solve the equation.   19) a) $log_5(x - 3) = 3$

b) $log_3(x - 2) + log_3(x - 8) = 3$

Solve the exponential equation. Use a calculator to obtain a decimal approximation, correct to two decimal places, for the solution.   20) $2^{x+8} = 4$

21) $e^{x+6} = 2$

Solve the problem.
22) Austin invested $12,000 in an account at 12% compounded quarterly. Find the amount in Austin's account after a period of 6 years.

Solve the problem. Round to the nearest cent.
23) What principal invested at 6%, compounded continuously for 3 years, will yield $1500? Round the answer to two decimal places.

Solve the problem. Round your answer to three decimals.
24) What annual rate of interest, compounded annually, is required to double an investment in 8 years?

Solve the problem.

25) The size P of a small herbivore population at time t (in years) obeys the function $P(t) = 500e^{0.2t}$ if they have enough food and the predator population stays constant. After how many years will the population reach 2000? Round to the nearest hundredth.

26) The logistic growth model $P(t) = \dfrac{990}{1 + 27.29e^{-0.348t}}$ represents the population of a bacterium in a culture tube after t hours. When will the amount of bacteria be 690?

27) Conservationists tagged 120 black-nosed rabbits in a national forest in 2009. In 2012, they tagged 240 black-nosed rabbits in the same range. What is the rate of growth?   If the rabbit population follows the exponential law, how many rabbits will be in the range 5 years from 2009?

28) A fossilized leaf contains 25% of its normal amount of carbon 14. What is the rate of decay?   How old is the fossil (to the nearest year)? Use 5600 years as the half-life of carbon 14.