

Worksheet 13

Sections 4.1, 4.2, 4.3 & 4.4

Sections 4.1 and 4.2

Problem 1. (a) Let $f(x) = 3^x$. Write all of the transformations of the function f that appear in the function g below. State the domain and range of g .

$$g(x) = 1 - 3^{-x}.$$

(b) Let $F(x) = 2^x$. Write all of the transformations of the function F that appear in the function G below. State the domain and range of G .

$$G(x) = \left(\frac{1}{2}\right)^{x-2} - 3.$$

Problem 2. A certain breed of mice was introduced onto a small island with an initial population of 320 mice, and scientists estimate that the mouse population is growing one and a half times every year.

- (a) Find a function P that models the number of mice after t years.
- (b) Estimate the mouse population after 8 years.

Sections 4.3 & 4.4

Problem 3. Solve for x in each of the following equations.

(a) $4^x + 2^{1+2x} = 50$, (b) $10(1.45)^{10x} = 50$, (c) $2 \log_2(x) = \log_2(2) + \log_2(3x - 4)$.

Problem 4. Let $F(x) = \ln(x)$. Write all of the transformations of the function F that appear in the function G below. State the domain and range of G .

$$G(x) = \ln(1 - x) - 2.$$