You should be able to answer questions dealing with these concepts. Study the practice problems, guided examples, WeBWorK, and examples worked in the textbook, as well as the practice test.

Previous work that will be needed

- composition of functions
- quadratic formula
- inverse functions
- transforming functions
- basic properties of functions (domain, range, symmetry, etc)
- average rate of change (could be one involving square root, fractions, or powers)

Exponential, Logistic, and Logarithmic Functions

- exponential functions $y = \frac{e^{kx}}{c}$ or $y = b^x$
- logistic functions $y = \frac{c}{1 + ae^{-kx}}$
  - properties of exponents: If x and y are real numbers, and $b > 0$ is real, then
    1. $b^x \cdot b^y = b^{x+y}$
    2. $\frac{b^x}{b^y} = b^{x-y}$
    3. $(b^x)^y = b^{xy}$
  - nomenclature: base, exponent
  - exponential growth ($b > 1$) and exponential decay ($0 < b < 1$)
  - the natural base e
  - the basic functions $y = e^x$ and $y = \ln x$
  - sketching and transforming exponential functions
- constructing exponential population models
- logarithmic functions $f(x) = \log_b x$
  - interpreted as the inverse function of the exponential function
  - sketching and transforming logarithmic functions
  - properties of logarithms: If x and y are positive numbers, and $b > 0, b \neq 1$ is real, then
    1. $\log_b(xy) = \log_b x + \log_b y$
    2. $\log_b\left(\frac{x}{y}\right) = \log_b x - \log_b y$
    3. $\log_b(x^r) = r \log_b x$ where r is any real number
  - change of base
  - common logarithms ($y = \log x$) and natural logarithms ($y = \ln x$)
- solving equations involving logarithms and exponentials
  - extraneous solutions