Chapter 4 Exponential and Logarithmic Functions

Course Number

Instructor

Date

Section 4.1 Exponential Functions and Their Graphs

Objective: In this lesson you learned how to recognize, evaluate, and graph exponential functions.

Important Vocabulary Define each term or concept.

Algebraic functions

Transcendental functions

Natural base *e*

I. Exponential Functions (Page 298)

What you should learn
How to recognize and evaluate exponential functions with base *a*

The **exponential function *f* with base *a*** is denoted by _____, where $a > 0$, $a \neq 1$, and x is any real number.

Example 1: Use a calculator to evaluate the expression $5^{3/5}$.

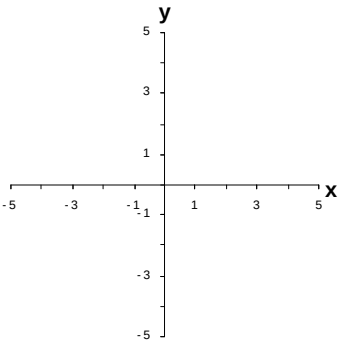
II. Graphs of Exponential Functions (Pages 299–301)

What you should learn
How to graph exponential functions

For $a > 1$, is the graph of $y = a^x$ increasing or decreasing over its domain? _____

For $a > 1$, is the graph of $y = a^{-x}$ increasing or decreasing over its domain? _____

For the graph of $y = a^x$ or $y = a^{-x}$, $a > 1$, the domain is _____, the range is _____, and the intercept is _____. Also, both graphs have _____ as a horizontal asymptote.



Example 2: Sketch the graph of the function $f(x) = 3^{-x}$.

III. The Natural Base *e* (Pages 302–303)

What you should learn
How to recognize, evaluate, and graph exponential functions with base *e*

The **natural exponential function** is given by the function _____.

Example 3: Use a calculator to evaluate the expression $e^{3/5}$.

For the graph of $f(x) = e^x$, the domain is _____,

the range is _____, and the intercept is _____.

The number *e* can be approximated by the expression

_____ for large values of *x*.

IV. Compound Interest and Other Applications (Pages 304–306)

What you should learn
How to use exponential functions to model and solve real-life problems

After *t* years, the balance *A* in an account with principal *P* and annual interest rate *r* (in decimal form) is given by the formulas:

For *n* compoundings per year: _____

For continuous compounding: _____

Example 4: Find the amount in an account after 10 years if $6000 is invested at an interest rate of 7%,
(a) compounded monthly.
(b) compounded continuously.

Homework Assignment

Page(s)

Exercises