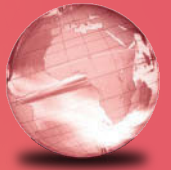


GLOBAL  
EDITION



# Calculus & Its Applications

FOURTEENTH EDITION

Goldstein • Lay • Schneider • Asmar





Pearson

# Pearson MyLab Mathematics: Support You Need, When You Need It



MyMathLab is the world's leading online program in mathematics, integrating homework with support tools and tutorials in an easy-to-use format. MyMathLab helps you get up to speed on course material, visualize the content, and understand how math will play a role in your future career.

## Review Prerequisite Skills

Integrated Review content identifies gaps in prerequisite skills and offers help for just those skills you need. With this targeted practice, you will be ready to learn new material.

Section 4 GR (online-only)

**Get Ready for Chapter 4**

This page is designed to help you with prerequisite skills that are needed to be successful with this chapter's content.

**Skills Check**

Check that you have the skills needed for this chapter by taking the [Chapter 4 Skills Check Quiz](#).

**Skills Review**

Brush up skills you need to review by watching the videos below.

Find the equation of a line given a point and the slope	<a href="#">Video</a>
Find the equation of a vertical line through two points	<a href="#">Video</a>
Find the composition of functions	<a href="#">Video</a>
Decompose functions	<a href="#">Video</a>
Convert between radicals and rational exponents	<a href="#">Video</a>
Simplify complex rational expressions	<a href="#">Video</a>
Simplify exponential expressions	<a href="#">Video</a>
Simplify exponential expressions involving rational exponents	<a href="#">Video</a>
Use the properties of logarithms	<a href="#">Video</a>

**Skills Practice**

After taking the quiz, practice the skills you need to master on the [Chapter 4 Skills Review Homework](#).

Find constant solution(s) of  $y' = 4 - y^2$ .

$f(t) = c$   
 $f'(t) = 0$

$f'(t) = 4 - (f(t))^2$   
 $0 = 4 - c^2$   
 $c^2 = 4$   
 $c = \pm 2$

$f(t) = 2$   
 $0 = 4 - (2)^2$

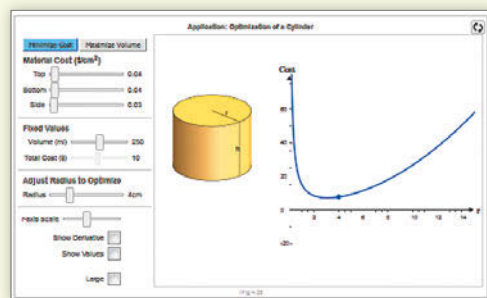
$f(t) = -2$   
 $0 = 4 - (-2)^2$

## Tutorial Videos

Tutorial videos are available for every section of the textbook and cover key examples from the text. These videos are especially handy if you miss a lecture or just need another explanation.

## Interactive Figures

Interactive Figures illustrate key concepts and help you visualize the math. MyMathLab also includes assignable exercises that require use of Interactive Figures and instructional videos that explain the concept behind each figure.



# Calculus & Its Applications, Global Edition

## Table of Contents

Cover

Inside Front Cover

Title Page

Copyright Page

Contents

Preface

Acknowledgments

Acknowledgments for the Global Edition

Prerequisite Skills Diagnostic Test

Introduction

0 Functions

0.1 Functions and Their Graphs

0.2 Some Important Functions

0.3 The Algebra of Functions

0.4 Zeros of FunctionsThe Quadratic Formula and Factoring

0.5 Exponents and Power Functions

0.6 Functions and Graphs in Applications

Chapter Summary and Chapter Review Exercises

1 The Derivative

1.1 The Slope of a Straight Line

1.2 The Slope of a Curve at a Point

1.3 The Derivative and Limits

1.4 Limits and the Derivative

1.5 Differentiability and Continuity

1.6 Some Rules for Differentiation

1.7 More about Derivatives

1.8 The Derivative as a Rate of Change

Chapter Summary and Chapter Review Exercises

# **Table of Contents**

## **2 Applications of the Derivative**

- 2.1 Describing Graphs of Functions
- 2.2 The First- and Second-Derivative Rules
- 2.3 The First- and Second-Derivative Tests and Curve Sketching
- 2.4 Curve Sketching (Conclusion)
- 2.5 Optimization Problems
- 2.6 Further Optimization Problems
- 2.7 Applications of Derivatives to Business and Economics
- Chapter Summary and Chapter Review Exercises

## **3 Techniques of Differentiation**

- 3.1 The Product and Quotient Rules
- 3.2 The Chain Rule
- \*3.3 Implicit Differentiation and Related Rates
- Chapter Summary and Chapter Review Exercises

## **4 The Exponential and Natural Logarithm Functions**

- 4.1 Exponential Functions
- 4.2 The Exponential Function  $e^x$
- 4.3 Differentiation of Exponential Functions
- 4.4 The Natural Logarithm Function
- 4.5 The Derivative of  $\ln x$
- 4.6 Properties of the Natural Logarithm Function
- Chapter Summary and Chapter Review Exercises

## **5 Applications of the Exponential and Natural Logarithm Functions**

- 5.1 Exponential Growth and Decay
- 5.2 Compound Interest
- 5.3 Applications of the Natural Logarithm Function to Economics
- 5.4 Further Exponential Models
- Chapter Summary and Chapter Review Exercises

## **6 The Definite Integral**

- 6.1 Antidifferentiation
- 6.2 The Definite Integral and Net Change of a Function
- 6.3 The Definite Integral and Area under a Graph
- 6.4 Areas in the  $xy$ -Plane

# **Table of Contents**

6.5 Applications of the Definite Integral

Chapter Summary and Chapter Review Exercises

## **7 Functions of Several Variables**

7.1 Examples of Functions of Several Variables

7.2 Partial Derivatives

7.3 Maxima and Minima of Functions of Several Variables

7.4 Lagrange Multipliers and Constrained Optimization

7.5 The Method of Least Squares

7.6 Double Integrals

Chapter Summary and Chapter Review Exercises

## **8 The Trigonometric Functions**

8.1 Radian Measure of Angles

8.2 The Sine and the Cosine

8.3 Differentiation and Integration of  $\sin t$  and  $\cos t$

8.4 The Tangent and Other Trigonometric Functions

Chapter Summary and Chapter Review Exercises

## **9 Techniques of Integration**

9.1 Integration by Substitution

9.2 Integration by Parts

9.3 Evaluation of Definite Integrals

9.4 Approximation of Definite Integrals

9.5 Some Applications of the Integral

9.6 Improper Integrals

Chapter Summary and Chapter Review Exercises

## **10 Differential Equations**

10.1 Solutions of Differential Equations

10.2 Separation of Variables

10.3 First-Order Linear Differential Equations

10.4 Applications of First-Order Linear Differential Equations

10.5 Graphing Solutions of Differential Equations

10.6 Applications of Differential Equations

10.7 Numerical Solution of Differential Equations

Chapter Summary and Chapter Review Exercises

# **Table of Contents**

## **11 Taylor Polynomials and Infinite Series**

11.1 Taylor Polynomials

11.2 The NewtonRaphson Algorithm

11.3 Infinite Series

11.4 Series with Positive Terms

11.5 Taylor Series

Chapter Summary and Chapter Review Exercises

## **12 Probability and Calculus**

12.1 Discrete Random Variables

12.2 Continuous Random Variables

12.3 Expected Value and Variance

12.4 Exponential and Normal Random Variables

12.5 Poisson and Geometric Random Variables

Chapter Summary and Chapter Review Exercises

## **Appendix Areas under the Standard Normal Curve**

Learning Objectives (Online)

Sources

Selected Answers

Index of Applications

Index

Inside Back Cover

Back Cover