

# MAT150 Calculus

Overview (4/08)

## General Information:

Exam Title:	Calculus	Policies and Procedures:	[link to Registration]
Admin Code:	MAT150	Exam Prerequisites:	Precalculus (algebra, trigonometry and functions)
Exam Format:	Multiple-Choice		
Exam Length:	2 Hours, 60 Questions		
Exam Credit Hrs:	4 Semester Hrs - Lower Level		
Exam Texts:	[UExcel link to MBS Bookstore]	Additional Exam	
Additional Materials:	Content Guide	Requirements/Recommendations:	None

**Exam Description:** The UExcel Examination in Calculus measures knowledge and understanding of material typically taught in the first semester of a lower-level sequence in Calculus. The content of the examination corresponds with course offerings commonly called Calculus I. The examination assumes a familiarity with Precalculus topics including algebra, trigonometry, and functions. It tests for a knowledge of facts and terminology, an understanding of concepts and theories, and the student's ability to apply this knowledge and understanding in an analysis of problems in business, the sciences, and engineering.

## Exam Outcomes:

After you have successfully worked your way through the recommended study materials, you should be able to:

- demonstrate both conceptually and computationally an understanding of the three primary topics in Calculus: limits, derivatives, and integrals
- interpret limits based graphically, numerically, and by the application of the basic limit laws and the concept of continuity
- interpret derivatives graphically, numerically, by the definition, and by the application of basic derivative rules.
- interpret integrals graphically, numerically, by the definition, and by the application of basic integration rules
- demonstrate understanding of the relationship between definite and indefinite integrals
- apply the three primary topics of Calculus to problems in business, the sciences, and engineering

## Exam Content Areas:

1. Limits and Continuity (15%)
2. Derivatives (25%)
3. Applications of Derivatives (30%)
4. Integrals (30%)

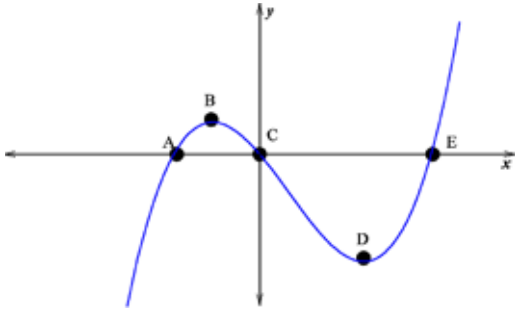
## Recommended Resources:

Anton, H.A., Bivens, I., & Davis, S. (2005). *Calculus: Early transcendentals: Single variable* (8th ed.). Hoboken, NJ: Wiley. ISBN-13: 9780471482383



## Sample Questions

1. The graph below shows a function  $f(x)$ .



At what points on the function does  $f'(x) = 0$ ?

- point A
- point B
- point C
- point D
- point E

2. A particle moves with a velocity of  $v(t) = \frac{\sin t}{\cos^2 t}$  for  $0 \leq t < \frac{\pi}{2}$ . What is the position of the particle at  $t = \frac{\pi}{4}$ ?

- $\frac{2}{\sqrt{2}} - 1$
- $\frac{\sqrt{2}}{2} - 1$
- $1 - \frac{2}{\sqrt{2}}$
- $1 - \frac{\sqrt{2}}{2}$

3. Let  $f(x) = \int_0^{x^2} \sin(t^3) dt$ .

What is the value of  $\frac{d}{dx} f(x)$ ?

- $\sin(x^6)2x$
- $\sin(x^2)$
- $\cos(x^6)2x$
- $\cos(x^2)$

4. What is the value of  $\frac{dy}{dx}$  for  $y = e^x - \cos(x)$ ?

- $e^{2x} + \sin(x)$
- $e^{2x} - \sin(x)$
- $2e^{2x} + \sin(x)$
- $2e^{2x} - \sin(x)$

5. Which is the equation of the tangent line to  $y = \ln x$  at  $x = 1$ ?

- $y = 2 - \frac{1}{x}$
- $y = x$
- $y = \frac{1}{x}$
- $y = 2 - x$