Calculus Videos

Megan Martinez

January 28, 2017

Contents

Part I

Derivatives

Derivatives

Introduction

On the next pages, you will watch videos about derivatives and will then answer some questions about the video.

The key ideas of these videos are:

- The goal of this video is to understand how a GPS unit can find the speed of a car 10 seconds after it leaves an intersection.
- You can approximate the speed at 10 seconds by finding an average speed over an interval immediately before or after the 10-second mark.
- Average speed is found by dividing change in distance by change in time
- For fixed amounts of change in time t, the changes in the cars distance will be increasing. Consequently, using the interval before the 10-second mark produces an underestimate of the cars speed.

Learning outcomes:

Derivatives

Video: Intro to Approximating Speed

YouTube link: https://www.youtube.com/watch?v=pJko-zIvXPI

Learning outcomes:

Derivatives

Video: Better Approximations to Speed

YouTube link: https://www.youtube.com/watch?v=cj_ATjLbLOI

Learning outcomes:

Derivatives

Questions

Google Form link: https://docs.google.com/forms/d/e/1FAIpQLSfa8U6U4gIlQ1WHaFWZ2cbfZLMLVL4dsy6J

Learning outcomes:

Derivatives

Stop

This is the end of the derivatives section.

Learning outcomes:

Part II

Graphing Derivative Functions

Graphing Derivative Functions

Introduction

On the next page, you will watch a video on graphing derivative functions and will then answer some questions about the video.

Learning outcomes:

Graphing Derivative Functions

Video

YouTube link: https://www.youtube.com/watch?v=Zae2lpj2JNM

Learning outcomes:

Graphing Derivative Functions

Questions

Google Form link: https://docs.google.com/forms/d/e/1FAIpQLSfqC6_EYBLph2CYZ1O0wee1o7tky2c0lJan

Learning outcomes:

Graphing Derivative Functions

Stop

This is the end of the graphing derivative functions section.

Learning outcomes:

Part III

Using Basic Derivative Rules

Using Basic Derivative Rules

Introduction

On the next pages, you will watch videos about using basic derivative rules and will then answer some questions about the video.

Here are four questions that you should be able to answer after watching the video:

(a) Why is the derivative of a constant function zero?

(b) How do you find the derivative of a polynomial?

(c) How do you find the derivative of an exponential function?

(d) How do you find the derivative of a logarithmic function?

Learning outcomes:

Using Basic Derivative Rules

Video: The Power Rule

YouTube link: https://www.youtube.com/watch?v=007aEaYcEpA

Learning outcomes:

Using Basic Derivative Rules

Video: Derivatives of Exponentials and Logs

YouTube link: https://www.youtube.com/watch?v=Raw6bJyLvks

Learning outcomes:

Using Basic Derivative Rules

Questions

Google Form link: https://docs.google.com/forms/d/e/1FAIpQLSdWnAJ_3zVZ0f2Kq6mvodlnDac8_bNR34QdlTjQaQLCOYlLeQ

Learning outcomes:

Using Basic Derivative Rules

Stop

This is the end of the basic derivative rules section.

Learning outcomes:

Part IV
The Chain Rule
The Chain Rule

Introduction

On the next pages, you will watch two videos about the chain rule and will then answer some questions about the video.

- The goals of these videos are to explain when you would need to use the chain rule and how to use the chain rule to find derivatives
- You use the chain rule when you have two composed functions - one function "inside" another, like $f(g(x))$
- To find the derivative, you do $f'(g(x)) * g'(x)$
- The reason for doing this is because the derivative of f doesnt just depend on x, but rather on the value of $g(x)$. So when $g(x)$ changes quickly, it affects how quickly $f(g(x))$ changes

Learning outcomes:

The Chain Rule

Video: Introduction

YouTube link: https://www.youtube.com/watch?v=GHlKQGhWSSA

Learning outcomes:

The Chain Rule

Video: Procedure

YouTube link: https://www.youtube.com/watch?v=jotTOiJLfn0

Learning outcomes:

The Chain Rule

Questions

Google Form link: https://docs.google.com/forms/d/e/1FAIpQLSdV_TKpsDHqljRzJq-0Nm5gne6q4Xwh33URA

Learning outcomes:

The Chain Rule

Stop

This is the end of the chain rule section.

Learning outcomes:

Part V
Optimization
Optimization

Introduction

On the next page, you will watch two videos on optimization and will then answer some questions about the video.

Learning outcomes:

Optimization

Video

YouTube link: https://www.youtube.com/watch?v=neUU8B2W984

Learning outcomes:

Optimization

Video

YouTube link: https://www.youtube.com/watch?v=E2FvgfIr4kQ

Learning outcomes:

Optimization

Questions

Google Form link: https://docs.google.com/forms/d/e/1FAIpQLScU8Oe2G35lrgDnP_agBarJGeAkyapBzijVGHMkONcr3TOKzQ

Learning outcomes:

Optimization

Stop

This is the end of the optimization section.

Learning outcomes:

Part VI

Integrals from Riemann Sums

Integrals from Riemann Sums

Introduction

On the next page, you will watch two videos about constructing integrals from Riemann sums and will then answer some questions about the video.

Learning outcomes:

Integrals from Riemann Sums

Video

YouTube link: https://www.youtube.com/watch?v=-VPLnHJ8-Yo

Learning outcomes:

Integrals from Riemann Sums

Video

YouTube link: https://www.youtube.com/watch?v=8OqgskFG-dA

Learning outcomes:

Integrals from Riemann Sums

Questions

Google Form link: https://docs.google.com/forms/d/e/1FAIpQLSfWlPgiQPxQBMQ8afmf-E4Xl_95RKyWYpiM37Vid-Y_D2OHZQ

Learning outcomes:

Integrals from Riemann Sums

Stop

This is the end of the integrals from Riemann sums section.

Learning outcomes:

Part VII

Anti-derivatives

Antiderivatives

Introduction

On the next page, you will watch a video about antiderivatives and will then answer some questions about the video.

Video 7 outline to be written

Learning outcomes:

Antiderivatives

Video

Video 7 will appear here

Learning outcomes:

Antiderivatives

Questions

Google Form link: https://docs.google.com/forms/d/e/1FAIpQLSdZrONolV9WhFC0fDvGT-kkFPGbRdEGCp27Qg

Learning outcomes:

Antiderivatives

Stop

This is the end of the antiderivatives section.

Learning outcomes: