Calculus Chapter 3

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Critical Points and the Closed Interval Method

Video

Video

Section 3.1 in Stewart's Calculus.

Preclass Learning Objectives:

- Graphical understanding of extrema.
- Fermat's Theorem.
- Local extrema are critical points, the opposite isn't necessarily true.
- Extreme Value Theorem.
- The Closed Interval Method.

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The Mean Value Theorem

Section 3.2 in Stewart's Calculus.

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The Shape of a Graph

Video

Video

Section 3.3 in Stewart's Calculus.

Preclass Learning Objectives:

- If the derivative is positive on an interval, the original function is increasing on that interval. If the derivative is negative on an interval, the original function is decreasing on that interval.
- Concavity describes the direction a function is bending. A function is concave up on an interval, if the second derivative is positive on that interval and the function bends upwards. A function is concave down on an interval, if the second derivative is negative on that interval and the function bends downwards.

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Horizontal Asymptotes

Video

Video

Section 3.4 in Stewart's Calculus.

Preclass Learning Objectives:

- The end behavior of a function is described with limits.
- Horizontal asymptotes of power functions are either zero or do not exist (tend towards infinity).
- Determinate and indeterminate forms.

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Curve Sketching

Video

Section 3.5 in Stewart's Calculus.

Preclass Learning Objectives:

- The basics of curve sketching.

Optimization

Video

Section 3.7 in Stewart's Calculus.

Preclass Learning Objectives:

- Optimized solutions to problems are found at critical points. This technique is useful in obtaining information in natural, less mathematical, settings.

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Antiderivatives

Video

Section 3.9 in Stewart's Calculus.

Preclass Learning Objectives:

- Antiderivatives of a function f(x) are functions whose derivative is f(x).
- The antiderivatives of a function differ by only a constant.
- Antiderivatives of common functions.

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