

Resources on Derivative Applications

Paul's Online Notes:

You can find his lessons on derivative applications here:

<http://tutorial.math.lamar.edu/Classes/Calcl/DerivAppsIntro.aspx>

Alignment with textbook sections:

Paul's page	Our section
Critical Points	4.1: Maximum and Minimum Values
Minimum and Maximum Values	4.1: Maximum and Minimum Values
Finding Absolute Extrema	4.1: Maximum and Minimum Values
The Shape of a Graph, Parts I and II	4.3: How Derivatives Affect the Shape of a Graph
Optimization Problems	4.7: Optimization Problems
More Optimization Problems	4.7: Optimization Problems

Khan Academy:

You can find their videos on limits here: https://www.khanacademy.org/math/differential-calculus/derivative_applications

* = a tutorial exercise

4.1: Maximum and Minimum Values

Minima, maxima, and critical points

Finding critical numbers

*Critical numbers

4.3: How Derivatives Affect the Shape of a Graph

Testing critical points for local extrema

Identifying minima and maxima for $x^3-12x+2$

Concavity, concave upwards, and concave downwards intervals

Recognizing concavity exercise

*Recognizing concavity

Inflection points

Graphing using derivatives

Another example of graphing with derivatives

*Concavity and the second derivative

*Second derivative test

4.7: Optimization Problems

Minimizing sum of squares

Optimizing box volume graphically

Optimizing box volume analytically

Optimizing profit at a shoe factory

Minimizing the cost of a storage container

Expression for combined area of triangle and square

Minimizing combined area