

Concepts to know Exam 2: Math 142

covers sections 3.4, 3.5, 3.7, 4.1, 4.2, 4.3, 4.4, 4.7, 5.1, 5.2, 5.4

- continuous interest
- Average rate of change
- Instantaneous rate of change and the derivative
 - slope of the tangent line is the same as the instantaneous rate of change.
 - places where $f(x)$ is not differentiable
 - * where $f(x)$ is not defined
 - * where $f(x)$ is not continuous
 - * where $f(x)$ has a sharp point (sharp turning)
 - * where the tangent line is vertical
- Notation of the derivative: $f'(x)$, y' , $\frac{dy}{dx}$
- Derivative shortcut rules
 - constant
 - power
 - sum and difference
 - product rule
 - quotient rule
 - chain rule
 - exponential rules
 - logarithm rules
- Be able to simplify a derivative.
- Equation of the tangent line
- Finding the values of x where the function has a particular instantaneous rate of change.
- Marginal analysis with a cost function
 - Average cost function.
 - Marginal cost function.
 - Marginal average cost function.
 - Interpretations of the marginal analysis.
 - * exact cost of particular item.
 - * approximate cost of a particular item.
 - similar definitions for revenue and profit functions.
- Elasticity of Demand
 - solve demand equation for x .
 - elasticity formula
 - interpretation on how elasticity effects revenue.
 - using elasticity to maximize revenue
 - finding the change in demand for a change in price.
- finding critical values.
- first derivative sign chart.
- Finding the intervals where a function is increasing/decreasing.
- classifying critical values as local (relative) maximum, local (relative) minimum, or neither.
- higher order derivatives, 2nd, 3rd,....
- possible inflection values.
- inflection points
- second derivative test
- finding intervals where a function is concave up/concave down.
- sketch a graph of a function given basic information of the function.
- you should also be able to work most of the supplemental homework problems.
- Any additional topics discussed in class