

INDIAN HILL EXEMPTED VILLAGE SCHOOL DISTRICT
Mathematics Curriculum - May 2009
High School – Calculus

Main Idea/Essential Questions:

- Review the graphical, numerical and algebraic representations and characteristics of polynomial, rational, exponential, logarithmic, and trigonometric functions.
- How do we find the instantaneous rate using calculus?

Skills & Objectives:

- Solve problem situations involving derived measurements; e.g., density, acceleration.

Main Idea/Essential Questions:

- How do we test a graph of natural behavior for continuity?
- How do we find an average rate of speed vs. an instantaneous rate of speed given a graph modeling movement?

Skills & Objectives

- Solve problem situations involving derived measurements; e.g., density, acceleration.

Main Idea/Essential Questions:

- How can we analyze the graph of an animal population to determine the effects of a predator moving in the area?
- How can we use marginal cost and revenue to help make intelligent business decisions?

Skills & Objectives

- Analyze functions by investigating rates of change, intercepts, zeros, asymptotes, and local and global behavior.
- Construct algorithms for multi-step and non-routine problems.

Main Idea/Essential Questions:

- How do we find the derivative of all types of function?
- Can we draw a derivative function given the position function?
- How do we find the slope of a tangent line over a function with time implied?

Skills & Objectives

- Solve problem situations involving derived measurements; e.g., density, acceleration.

Main Idea/Essential Questions:

- How do you find the derivative of trig, log and exponential functions?
- How do we find Maximums, Minimums and Inflection Points so we can make decisions about revenue and profit?

Skills & Objectives

- Solve problem situations involving derived measurements; e.g., density, acceleration.

Main Idea/Essential Questions:

- How can you maximize the volume of a box with restrictions on materials?
- How fast is the radius of a spherical bubble changing as you blow into it at any given point in time?

Skills & Objectives

- Solve problem situations involving derived measurements; e.g., density, acceleration.

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Main Idea/Essential Questions:

- How do we find the area of regions that are shaped irregular? Can we be exact if we sum tiny rectangles inside the region?
- How do we use integration to find area under a curve of any function

Skills & Objectives:

- Explain differences among accuracy, precision and error, and describe how each of those can affect solutions in measurement situations.
- Estimate and compute areas and volume in increasingly complex problem situations.
- Solve problem situations involving derived measurements; e.g., density, acceleration.

Main Idea/Essential Questions:

- How do we integrate functions that use the chain rule backwards?
- How do we find areas trapped between two curves?
- How can we use integration techniques with area to calculate volume?

Skills & Objectives:

- Explain differences among accuracy, precision and error, and describe how each of those can affect solutions in measurement situations.
- Estimate and compute areas and volume in increasingly complex problem situations.
- Solve problem situations involving derived measurements; e.g., density, acceleration.

Main Idea/Essential Questions:

- How can integration to slice a solid into solid disks then add them up to find the volume?
- How can we find the volume of objects that have a hole running through them? (washer method)

Skills & Objectives:

- Explain differences among accuracy, precision and error, and describe how each of those can affect solutions in measurement situations.
- Estimate and compute areas and volume in increasingly complex problem situations.
- Solve problem situations involving derived measurements; e.g., density, acceleration.