

Curriculum Guide Calculus

Unit 6: Applications of the Definite Integral in Geometry, Science, and Engineering

Biblical Worldview Essential Questions:

Integration is used to find volumes of regular shaped objects.
What are some Bible verses that are about solid and liquid volumes?

15 Lessons

C#4

Objectives	Methods	Resources	Assessment
The students will 1. use the definite integral to find the area between two curves. 2. find volumes of three-dimensional solids by slices, disks and washers methods. 3. find volumes of three-dimensional solids by cylindrical shells methods. 4. use definite integrals to find “work” as defined in physics and engineering.	<ul style="list-style-type: none">• teacher lecture• teacher working examples on the board• related YouTube videos• student guided practice of problems in book• cooperative learning groups• individual assistance• partner work• homework	<ul style="list-style-type: none">• Calculus: Graphical, Numerical, Algebraic, 4th Ed., Ross L. Finney . . . [et al.]; Pearson Education, 2012	<ul style="list-style-type: none">• check homework• Quizzes• Tests• Oral response• Board work

Curriculum Guide Calculus

Unit 7: Inverse Functions: Exponential, Logarithmic, and Inverse Trigonometric functions

Biblical Worldview Essential Questions:

Why did the lifespans of the patriarchs from Noah to Joseph decrease exponentially?

25 Lessons

C#6, C#7, C#10

Objectives	Methods	Resources	Assessment
The students will 1. find and graph inverse functions. 2. discover and use the relationship between the derivative of a function and the derivative of its inverse. 3. review properties and uses of exponential and logarithmic functions. 4. memorize and use the derivative formulas for exponential and logarithmic functions. 5. develop, memorize and use the derivative formulas for inverse trigonometric functions. 6. use L'Hospital's Rule to find limits of indeterminate forms.	<ul style="list-style-type: none">• teacher lecture• teacher working examples on the board• related YouTube videos• student guided practice of problems in book• cooperative learning groups• individual assistance• partner work• homework	<ul style="list-style-type: none">• Calculus: Graphical, Numerical, Algebraic, 4th Ed., Ross L. Finney . . . [et al.]; Pearson Education, 2012	<ul style="list-style-type: none">• check homework• Quizzes• Tests• Oral response• Board work

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Unit 8: Techniques of Integration

Biblical Worldview Essential Questions:

Approximation is often “good enough.”

Why don't we find approximate measures in the Bible?

5 Lessons (4 weeks)

C#9

Objectives	Methods	Resources	Assessment
The students will perform numerical integration approximation using the Midpoint Rule and Trapezoidal Rule.	<ul style="list-style-type: none">• teacher lecture• teacher working examples on the board• related YouTube videos• student guided practice of problems in book• cooperative learning groups• individual assistance• partner work• homework	<ul style="list-style-type: none">• Calculus: Graphical, Numerical, Algebraic, 4th Ed., Ross L. Finney . . . [et al.]; Pearson Education, 2012	<ul style="list-style-type: none">• check homework• Quizzes• Tests• Oral response• Board work

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Unit 9: Differential Equations

Biblical Worldview Essential Questions:

Why are there so many different English versions of the Bible?

13 Lessons (2 weeks)

C#12

Objectives	Methods	Resources	Assessment
The students will <ol style="list-style-type: none">1. model population growth using differential equations2. express differential equations using direction fields.3. solve separable differential equations.4. solve exponential growth and decay problems.	<ul style="list-style-type: none">• teacher lecture• teacher working examples on the board• related YouTube videos• student guided practice of problems in book• cooperative learning groups• individual assistance• partner work• homework	<ul style="list-style-type: none">• Calculus: Graphical, Numerical, Algebraic, 4th Ed., Ross L. Finney . . . [et al.]; Pearson Education, 2012	<ul style="list-style-type: none">• check homework• Quizzes• Tests• Oral response• Board work