Calculus II Project 2:

Select your project team: (Recommended: 1-2 students.)

1.   Name: _____   Sec: _____

   Email: _____   Phone: _____

   IM: _____   Facebook: _____

2.   Name: _____   Sec: _____

   Email: _____   Phone: _____

   IM: _____   Facebook: _____

Please indicate 3 choices.

Possible Projects from Chapter 12.

12.19: ____Curves Generated by Rolling Circles
12.20: ____The Wankel Rotary Engine
12.21: ____Shakespeare's Shylock
12.23: ____Pension Funds

Possible Maplets:

Derivatives: **Applications**:
1.   ____Increasing or Decreasing by Factoring Deriv and using Number Line
   Find the intervals on which a function is increasing or decreasing by factoring the derivative and plotting its sign on a number line.
2.   ____Concave Up or Down by Factoring Second Deriv and using Number Line
   Find the intervals on which a function is concave up or down by factoring the second derivative and plotting its sign on a number line.

Integrals: **Foundations**:
3.   ____Midpoint Riemann Sums
   Compute a Riemann sum using the midpoint rule.
4.   ____Limits of Sums
   Compute limits of sums of polynomials using the formulas for the sum of 1, i, i^2, i^3 and i^4.
5.   ____Areas by Riemann Sums
   Compute areas by using Riemann sums.
6.   ____Properties of Integrals
   Learn about the properties of integrals.
7.   ____Int by Parts Twice and Solve
   Compute integrals of products of trig and exponential functions.
8.   ____Hard Trig Integrals
   Compute integrals of products of even powers of trig functions.
9.   ____Improper Integrals at Interior Point
   Compute integrals which are improper at an interior point.

Integrals: Applications:

10. ____Area between Curves that Cross

Compute the area between two curves which intersect once in the interval.

11. ____Arc Length for Parametric Curves

Add parametric curves to the maplet on arc length.

12. ____Surface Area for Parametric Curves

Add parametric curves to the maplet on surface area.

Differential Equations:

13. ____Direction Fields II

Given the direction field plot, identify the differential equation.

14. ____Newton's Law of Heating

Set up and solve the differential equations for the heating or cooling of an object.

15. ____Kirchhoff's Laws

Set up the differential equation for a single circuit with resistance, capacitance and inductance.

16. ____Electric Circuits

Solve the differential equations describing the charge or current in an electric circuit with resistance and either capacitance or inductance.

Sequences and Series:

17. ____New Numerical Series from Old

Combine series using sums, diferences and constant multiples.

18. ____Power Series: Center and Radius of Conv

Find the center and radius of convergence of a power series.

19. ____Power Series: Interval of Conv

Given the center and radius of convergence of a power series, find its interval of convergence.

20. ____New Power Series from Old

Combine power series using sums, differences, constant multiples, substitutions, derivatives and integrals.

21. ____Compute Taylor Polynomials

Compute a Taylor polynomial for a function.

22. ____Approximate functions using Taylor Polynomials

Approximate the value of a function using a Taylor polynomial at a nearby point.

23. ____Compute Taylor Series

Find the general term of the Taylor series for a function.

24. ____New Maclaurin Series from Old

Combine Maclaurin series using sums, differences, constant multiples, substitutions, derivatives and integrals.

25. ____Summing Series Using Maclaurin Series

Sum a numerical series by evaluating a Maclaurin series.

26. ____Deriv by Taylor Series

Evaluate a higher order derivative by looking at the coefficients of a Taylor series.

Other:

27. ____Title: _____

Description:_____