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provided by a battery system. Newton's law of cooling is a governing differential equation...

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9 Applications of Integration 9.1 Area  
between ves cur We have seen how  
integration can be used to find an area

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between a curve and the x-axis. With very little change we can find some areas between curves; indeed, the area between

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project. The application projects involved both teamwork and individual

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work, and we required use of both programmable calculators and Matlab for these projects. Some projects involved use of real data often collected by the involved faculty. The paper lists all the projects, including where they fit within the course topics.

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Chapter 7 — Applications of Integration  
5 The definition of the work done by a constant force  $F$  on a particle is given by the dot product (sometimes called the scalar

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product)  $Work = Force \cdot Displacement$  or  
 $Work = F \cdot (q - p)$  if  $p$  is the starting  
position and  $q$  the ending position.

Maybe it is no harm to recall a few little  
things about dot products. If  $a = a_1i + a_2j + a_3k$

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Chapter 6 : Applications of Integrals.  
Here are a set of practice problems for the Applications of Integrals chapter of the Calculus I notes. If you'd like a pdf document containing the solutions the download tab above contains links to pdf's containing the solutions for the full book, chapter and section.

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## **Chapter 7: Applications of Integration**

Application of these two laws to an electrical circuit facilitates the formulation of a system of  $n$  linear equations when  $n$  unknown quantities exist. University of Michigan Department of Mechanical Engineering January 10, 2005

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applications in mechanical engineering  
Now the applications of multiple  
integrals in mechanical engineering are  
the basic applications of them i.e. to find  
areas and volumes of various bodies just  
by taking a little part of them into

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consideration.

## **Applications of Integration - Whitman College**

Chapter 6 : Applications of Integrals. In this last chapter of this course we will be taking a look at a couple of Applications of Integrals. There are many other applications, however many of them

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require integration techniques that are typically taught in Calculus II.

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metering of water flow or electric power. Electronic analogue integrators are the basis of analog computers and charge amplifiers. Integration is also performed by digital computing algorithms.

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$f(x)dx$ : Hooke's Law: the force required to stretch or compress a spring beyond

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its natural length is  $f(x) = kx$  where  $k$  is called the spring constant. A force of 10 lb is required to stretch a spring from its natural length of 7 in to 7.5 in. Find the work done in stretching the spring.

### **Calculus I - Applications of Integrals**

The application of a systematic ,  
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Calculus (differentiation and integration) was developed to improve this understanding. Differentiation and



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integration can help us solve many types of real-world problems . We use the derivative to determine the maximum and minimum values of particular functions (e.g. cost, strength, amount of material used in a building, profit, loss, etc.).

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Applications of Integration; 1.  
Applications of the Indefinite Integral; 2.  
Area Under a Curve by Integration; 3.  
Area Between 2 Curves using  
Integration; 4a. Volume of Solid of  
Revolution by Integration; 4b. Shell  
Method: Volume of Solid of Revolution;

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5. Centroid of an Area by Integration;
6. Moments of Inertia by Integration;
- 7.