DOWNLOAD PDF APPLICATION OF DIFFERENTIATION IN DAILY LIFE

Chapter 1 : Derivative applications | Khan Academy

The Use of Differentiation In Real-life Applications Task 1 Differentiation is very important in many fields, and has made great contributions in these fields, which are still noticed nowadays.

When am I ever going to use this in real life? Unlike basic arithmetic or finances, calculus may not have obvious applications to everyday life. However, people benefit from the applications of calculus every day, from computer algorithms to modeling the spread of disease. While you may not sit down and solve a tricky differential equation on a daily basis, calculus is still all around you. Search Engines Algorithms are used every day by major search engine companies to help refine searches for the person behind the keyboard. Algorithms are calculations used to compile a large amount of data and variables into an equation, spitting out the best possible answer. These algorithms are what makes search engines so adept at finding the precise answer quickly. All of these variables are utilized to define the rules and constraints of sequent calculus equations that produce the most logical and effective results. Weather Models Weather is more accurately predicted than ever before. Part of the improvement is thanks to technology, such as computer modeling that uses calculus and is able to more meticulously predict upcoming weather. These computer programs also use types of algorithms to help assign possible weather outcomes in a region. Much like in the computer algorithms, weather forecasts are determined by considering many variables, such as wind speed, moisture level and temperature. Though computers do the heavy lifting of sifting through massive amounts of data, the basics of meteorology are grounded in differential equations, helping meteorologists determine how changes in the temperatures and pressures in the atmosphere may indicate changes in the weather. Sciencing Video Vault Improving Public Health The field of epidemiology -- the study of the spread of infectious disease -- relies heavily on calculus. Such calculations have to take three main factors into account: With these three variables, calculus can be used to determine how far and fast a disease is spreading, where it may have originated from and how to best treat it. Calculus is especially important in cases such as this because rates of infection and recovery change over time, so the equations must be dynamic enough to respond to the new models evolving every day. Architecture Calculus is used to improve the architecture not only of buildings but also of important infrastructures such as bridges. Bridges are complex constructions because they have to be able to support varying amounts of weight across large spaces. When designing a bridge, one must take into account factors including weight, environmental factors and distance. Because of this, maths such as differential calculus and integral calculus are often used to create the most robust design. The use of calculus is also creating a change in the way other architecture projects are designed, pushing the frontier of what sorts of shapes can be used to create the most beautiful buildings. For example, though many buildings have arches with perfect symmetry, calculus can be used to create archways that are not symmetric along with other odd shapes that are still able to be structurally sound.

DOWNLOAD PDF APPLICATION OF DIFFERENTIATION IN DAILY LIFE

Chapter 2 : How do we use derivatives in our daily lives - Mathematics Stack Exchange

Differentiation and 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.).

Before calculus was developed, the stars were vital for navigation. Shipwrecks occured because the ship was not where the captain thought it should be. There was not a good enough understanding of how the Earth, stars and planets moved with respect to each other. Calculus differentiation and integration was developed to improve this understanding. Differentiation and 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. Derivatives are met in many engineering and science problems, especially when modelling the behaviour of moving objects. Our discussion begins with some general applications which we can then apply to specific problems. Related Sections in Introduction to Calculus , where there is a brief history of calculus. The Derivative , an introduction to differentiation, for those who have never heard of it. Differentiation of Transcendental Functions , which shows how to find derivatives of sine, cosine, exponential and tangential functions. Integration , which is actually the opposite of differentiation. Differential Equations , which are a different type of integration problem, but still involve differentiation. In this Chapter 1. Tangents and Normals which are important in physics eg forces on a car turning a corner 2. Curvilinear Motion , which shows how to find velocity and acceleration of a body moving in a curve 4. Related Rates - where 2 variables are changing over time, and there is a relationship between the variables 5. Curve Sketching Using Differentiation , where we begin to learn how to model the behaviour of variables 7. Applied Maximum and Minimum Problems , which is a vital application of differentiation 8. Radius of Curvature , which shows how a curve is almost part of a circle in a local region.

DOWNLOAD PDF APPLICATION OF DIFFERENTIATION IN DAILY LIFE

Chapter 3 : Applications of Differentiation | Single Variable Calculus | Mathematics | MIT OpenCourseWare

A real-life application of integration and differentiation can be seen in economics. Differentiation is used to determine the relationship and effects of change in the independent variable and the effect of its price.

Infinite series Submitted by Marianne on June 9, The Plus teacher packages are designed to give teachers and students easy access to Plus content on a particular subject area. Most Plus articles go far beyond the explicit maths taught at school, while still being accessible to someone doing GCSE and A level maths. They put classroom maths in context by explaining the bigger picture â€" they explore applications in the real world, find maths in unusual places, and delve into mathematical history and philosophy. We therefore hope that our teacher packages provide an ideal resource for students working on projects and teachers wanting to offer their students a deeper insight into the world of maths. Infinite series One of the first bits of school maths that gives us a real glimpse of infinity are infinite series: Articles in this category give you explicit proofs of the convergence or divergence of some of our favourite series. Infinite series in mathematical action: These articles look at how series, their convergence or divergence, are used as tools in other mathematical results. Infinite series in real-life action: Here we explore how series can help us solve problems outside of maths. Infinite series and the biggest maths problem of them all: One famous series is the Riemann zeta function, which is involved in one of the biggest open problems in maths: Articles in this category give you a glimpse of it. Series â€" A visual and a mathematical proof of the convergence of our favourite geometric series. In perfect harmony â€" Does the harmonic series diverge? An infinite series of surprises â€" This article shows us how eighteenth-century mathematician Leonhard Euler solved one of the foremost infinite series problems of his day. Series in mathematical action Mathematical mysteries: Beauty in mathematics â€" One of the most beautiful equations in maths, explored with infinite series. Intriguing integrals â€" This article uses series to work out integrals in a clever way. Making the grade â€" This article uses infinite series to create monstrous functions. Series in real-life action Have we caught your interest? Is this a record? No limits for Usain â€" Usain Bolt, the "fastest man on the planet", aims to get his metre world record of 9. What has mathematics got to say about this quest? Another article involving the harmonic series. The solitaire advance â€" Infinite series help with a particular challenge in the game of solitaire. Infinite series and the biggest maths problem of them all A whirlpool of numbers â€" An introduction to the Riemann hypothesis and the zeta function. One L of a discovery â€" On the convergence and divergence of the Riemann zeta function and some of its cousins.

Chapter 4 : Applied Maximum and Minimum Problems

DAILY LIFE USES OF DIFFERENTIATION AND. INTEGRATION In Isaac Newton's day, one of the biggest problems was poor navigation at sea. Before calculus was developed, the stars were vital for navigation.

Curve Sketching The differentiation is the subfield of Calculus and there are various application of differentiation in real world. The differentiation is very important part of Math as it is used in many scientific fields. Differentiation can be defined as the process of finding the Derivatives of the Functions. Differentiation can be used as a tool to calculate or study the rate of change of a quantity with respect to change in some other quantity. The most common example is calculation of velocity and acceleration. Tangent- Tangent can be defined as a straight line that touches the curve at a Point and the Slope of curve and line is same. Normal- The perpendicular line to the Tangent of a curve is known as normal. Here we express x and y as function of time and it is known as parametric form. We will learn here that how to find the Slope in the different type of Differential Equations by the help of derivative. We will go through the several ways for finding the Slope of a derivative and also solves some of the problems related to the evaluation of the slopes in the derivatives. When we talk about the topic, first we have to understand the derivative of any expression. Derivative of a function generally shows the change in the function as the input of the function changes. So we can say that a derivative of a function is a quantity that shows that how much a quantity changes when any change occurs in the response of change in some other related quantity. For example the change in the Position of a particle occurs according to the change in the velocity of that object. The derivative of a function for a chosen value gives the best linear approximation in the function nearby of that input changing value. Now just talking about any of the real value function of a single variable, derivative at any of the Point of the function is the slope of the Tangent line to that graph at that point. In some of the higher dimensions, the derivative of a function at any particular point is the linear transformation of that function at that point. This linear transformation is also called as linearization of that function for that point. The concept of the slope in derivatives is totally same as the concept of the derivative in the differential equations. We simply calculate the differentiation of any of the function to get the derivative of that function. So, slope in derivatives is the process of finding differentiation of the function. Here f is the function of x in the terms of y and this y is dependent to the value of x. If both of the variables are the real Numbers then we can plot a graph for this function and this graph will have a number of tangents for different points on the graph, for a particular point we can find a tangent for that graph and this tangent will show the slope of the function f x on that point. We can find the slope of the function at any of the point on the graph. The slope of any curve at any point on that curve is the slope of the tangent line of the curve on that point. Here are a number of types of the function in the calculus mathematics where we calculate the slope of the function for any point of that function. The simplest case is the linear types of Functions where we have to find the slope. We can also get this formula by some of the calculation on the function. In the case if function is not linear, means it is not a Straight Line and the value of m changes accordingly. Differentiation is a perfect method to find the rate of change in any of the quantity. Here are several Notations for the slope in derivatives. To understand the concept of the slope in derivative, if we zoom the graph at any of the point such that the graph looks like a straight line on that point then the derivative at that is the slope of the line. Now talking about a real life example for change in the derivatives, say a velocity of a bike changes as the driver changes the speed and change in the distance occurs when change in the velocity occurs. The acceleration is the example of double derivative. Now just talking about the some of the examples, 1. Derivative of the expression: So, we have to find the derivative of the function at that point. Similarly, we can calculate the slope in derivatives all type of equations. Tangents Back to Top When we make an angle with the positive direction of x axis in anticlockwise sense is called as a tangent of line or Slope or gradient of line. So, tangent is a trigonometric angle, which is called as a Slope or gradient of the line. Now we discuss how we calculate tangent angle- Parallel to x axis: Perpendicular to x axis: So, when we calculate an angle from x axis, it produces 90 degree. Now we discuss how we calculate a tangent from a given equation: Now we discuss how we calculate tangent between two lines: Now we can say that if slope of two lines are equal than both

lines are parallel. Similarly there is a condition which shows perpendicularity: When two lines are perpendicular, then angle between both lines are 90 degree. We take some example which shows how we calculate tangent of a given curve by using differentiation - Example 1: These are example which shows us procedure to calculate tangents of curve and properties of tangents. Now we discuss how we derive equation of a line from a tangent: We use following steps to calculate equation- Step 1: These are example which shows procedure to calculate equation of tangent and shows how to calculate differentiation tangents. This rate of change is called the derivative of y with respect to x. Friends, limit of a function play an important role while calculating the Derivatives of different Functions. For example, the derivative of a function f x at some Point a can be computed by the relation. Friends, concept of differentiation is widely applicable in many calculations in Calculus differentiation and is mostly used to find the equations of Tangent normal and slopes of different curves. Study of differentiation leads to the study of derivability, continuity and differentiability of a function. Curve Sketching Back to Top In Geometry, a technique that defines basic concept of shape in a plane is called as curve sketching. So, curve sketching Calculus is basically used for solving a mathematical problem about shapes in geometry and for solving the typical mathematical problems like area, maximum, minimum value of certain equation or curve. For sketching a curve, we use following steps - Step 1: After above three steps, we check that curve is passing through origin or not and if the curve passes through the origin, then we calculate Tangent lines. For calculation of tangent lines, we solve lowest order term from the equation and remove all other terms of equation in algebraic curves. Next we solve highest order term of equation and calculate the points where the curve meets the line at infinity in algebraic curve. After all these steps, we calculate asymptotes of curve and also calculate where the asymptotes of the curve intersect the curve, means we calculate from which side the curve approaches to the asymptotes. In above 6 steps, we discussed all the processes, but we have not discussed, what are asymptotes of curve and how we sketch asymptotes of a curve. Knowledge of asymptotes is important for sketching a curve, so we will discuss asymptotes of a curve: An Asymptote of a curve is a line such that the distance between the curve and the line approaches zero as they tend to infinity. Apollonian of Persia introduced this term. Three kinds of asymptotes are used in mathematics named as a horizontal asymptotes, vertical asymptotes and oblique asymptotes. Vertical asymptotes are vertical lines according to which the function grows without any bound. This is all about asymptotes of a curve. Now we take an example which describes how we use above 6 steps - Example 1: By using above six steps sketch the curve of following function: Now we calculate the asymptotes of given function, vertical asymptotes are at -3 and at 3. Now we sketch the curve of the above equation by using all these things, which we have calculated in above steps. This is an example which shows what the basic steps for evaluating a curve are? Now we will discuss applications of curve sketching: Curve sketching technique is useful for finding out the maximum and minimum value of curve: We use following steps for finding maximum and minimum value by curve sketching technique - Step 1: After finding critical points, we will calculate second order derivative for finding that critical Point is local maximum point or local minimum point. Next, we will sketch a curve of the given equation, local maxima and local minima makes this easier because at local minima, curve moves in upward direction and at local maxima, curve moves in downward direction and at point of inflexion, its center point moves between the upward and downward side of curve. We take an example which defines the above process - Example: We use following steps to calculate local maxima and local minima - Step 1: When we sketch a curve of above equation, it makes a sharp point at local minima point towards upside. This is basic and best application of curve sketching.

DOWNLOAD PDF APPLICATION OF DIFFERENTIATION IN DAILY LIFE

Chapter 5 : Applications of Differentiation

I assume that by "real life", you really mean to ask the application of derivatives in our "everyday life". So, even though derivatives are used everywhere by science and technology, they are probably not the examples you seek.

Shipwrecks occured because the ship was not where the captain thought it should be. There was not a good enough understanding of how the Earth, stars and planets moved with respect to each other. Calculus differentiation and integration was developed to improve this understanding. Differentiation and 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. Derivatives are met in many engineering and science problems, especially when modelling the behaviour of moving objects. Applications of the Indefinite Integral shows how to find displacement from velocity and velocity from acceleration using the indefinite integral. There are also some electronics applications. In primary school, we learned how to find areas of shapes with straight sides e. But how do you find areas when the sides are curved? Area Under a Curve and 3. Area Between 2 Curves. Answer is by Integration. Volume of Solid of Revolution explains how to use integration to find the volume of an object with curved sides, e. Centroid of an Area means the centre of mass. We see how to use integration to find the centroid of an area with curved sides. Moments of Inertia explains how to find the resistance of a rotating body. We use integration when the shape has curved sides. Work by a Variable Force shows how to find the work done on an object when the force is not constant. Electric Charges have a force between them that varies depending on the amount of charge and the distance between the charges. We use integration to calculate the work done when charges are separated. Average Value of a curve can be calculated using integration.

Chapter 6 : Uses of Calculus in Everyday Life | Sciencing

Daily Life Uses of Differentiation - Download as Word Doc .doc /.docx), PDF File .pdf), Text File .txt) or read online. Scribd is the world's largest social reading and publishing site. Search Search.

Chapter 7 : Applications of Differential Equations

Thanks to calendrierdelascience.com Yeong Chyng Hafiz Hafizie and Rehnusha.

Chapter 8 : Applications of partial derivatives in daily life | Aqil Siddiqui - calendrierdelascience.com

A video on the topic of differentiation and its real life applications.

Chapter 9 : Calculus 1: Applications of Differentiation - Maple Programming Help

Unlike basic arithmetic or finances, calculus may not have obvious applications to everyday life. However, people benefit from the applications of calculus every day, from computer algorithms to modeling the spread of disease.