

Name = Niamat ulloh  
 Icd = 16596  
 Subject = Applied calculus  
 Assingment = # 01  
 Suimitted to Mediam ahumila

Application OF derivatives in Engineering  
 impo itant application in mathematics

- Rate of change of Quality.
- Increaseing and decreaseing Functions.
- Tangent and normal to a Curve.
- Minimum and Miximum values.
- Newtha Methads.
- Linear Approximations.

\*\*\* Rate of change of a Quality m  
 Grernal and Most important application  
 OF Derivatives or Example is

Check - the rate of ~~Var~~ change of the  
 Volume with respect to its decreasing  
 sides.

Form of derivatives used. (Page 2)

By rapid rate of change of value  
Dx represents change of sides of cube

### \* Increasing and Decreasing Functions.

To find that given function is increasing or decreasing or constant: Say in graph we use derivatives if it is function which is continuous [P.9] and differentiate in the open interval then [P.9] then.

### \* Maximum and Minimum

To calculate the weight and lowest point of the function is used.

•  $x = a$ , if  $f(x) \leq f(a)$  for every  $x$  in the domain, then  $f(x)$  has a absolute maximum, that is the point of the maximum value of  $f$ .

• When  $x = a$ , if  $f(x) \geq f(a)$  for every  $x$  in some open interval  $(P, Q)$  then  $f(x)$  has relative minimum.

- When  $x = a$ , if  $f(x) = f(a)$  every  $x$  in domain.
- When  $x = a$ , if  $f(x) \geq f(a)$  for every  $x$  in  $F(x)$  was a relative minimum value.

### \* Approximation or Finding Approximate

To find a very small change or variations of quantity. We can use derivatives to give the approximate value is represented by delta  $\Delta$ .

Suppose change in the values of  $x$ ,  $dx = \Delta x$   
 the  $dy/dx = \Delta x = x$

Since, the change in  $x$ ,  $dx = x$  then  $dy \approx y$

### \* Point of inflection:-

For concave functions  $F(x)$  if  $F'(x_0) = 0$   
 OR,  $F''(x_0)$  does not exist at point  $x_0$  and  $F''(x)$  changes sign when passing through  $x = x_0$  then  $x_0$  is called the point of inflection.



# \* Application OF Integration (Page 111)

- Area b/w curves
- Volume
- Kinetic energy improve
- Arc length

- Distance, velocity, acceleration, average
- Average volume of function on the
- Centre of mass
- Probability
- surface area

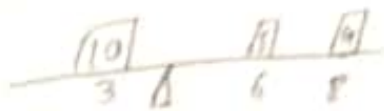
## \* Area between Curves :-

We have seen now integration can be used to find area between a curve x-axis with very little change we can use find same areas b/w curves indeed interpreted as the area b/w the curve and a second "curve" with equation  $y=0$  @ with easy to understand

## \* \* Centre of Mass .

Suppose a beam is 10 meters long and that there are three weights on the beam : a 10 Kilogram weight 3 meters from the left and, a 5 Kilogram weight 6 meters from the left and a 5 Kilogram weight 8 meters.

Frame left and a 4 Kilogram weight (100g)  
 similar from the left and when  
 should a placed so that mass beam  
 from beam from 0 at the left  
 can a length and location, let's assign  
 scale to the a denote locations on the  
 beam as simply as coordinates the  
 weight are at  $x=3$ ,  $x=6$  and  $x=8$  as



Suppose we begin with that  
~~Formula~~ <sup>Formula</sup> is applied at.

\* Arc Length:

Here, another geometric application  
 of the integral find a length of a  
 portion of a curve. As usual  
 might approximate the length  $\epsilon$   
 turn the approximation into compute on  
 know arc length, that of a line  
 segment, if then we length of we  
 the segment.

is the distance b/w the

Points  $\sqrt{(x_1-x_0)^2 + (y_1-y_0)^2}$  from the  
Pythagorean theorem as illustrated

