**Colorado Technical University**

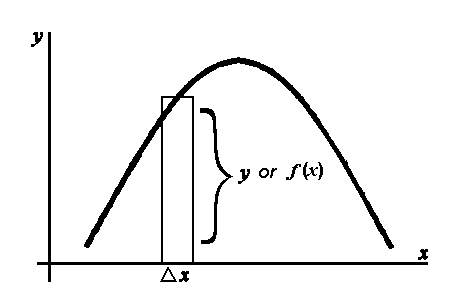
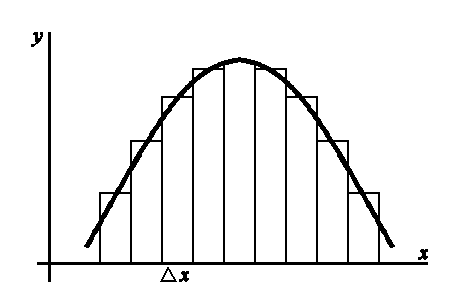
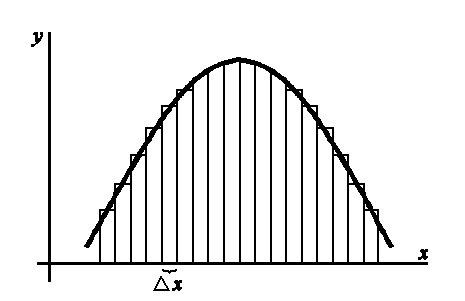
**Course:** MATH205 – Differential Calculus

## Unit 9 Part 17 Readings – Definite Integrals and

## Area Under a Curve

**Area Under a Curve**

This is the geometric interpretation of an integral



The area A under a curve *y* = *f*(*x*) from *x* = *a* to *x* = *b* is

lim

*n*→∞

A = sum of the *n* rectangles between *a* and *b*

= *∫ab* *f ’*(*x*) *dx*

*b*

*a*

= F(*x*) |

= F(*b*)  F(*a*)

where F(*x*) = *∫* *f* ' (*x*) *dx*

note: no constant of integration!

### **Definite Integral**

If *f* (*x*) is a continuous function between *x* = a and *x* = b and the

derivative of F(*x*) is *f* '(*x*) then

*∫ab* *f* '(*x*) *dx* = F(*b*)  F(*a*

*b*

*a*

= F(*x*) |

*Factoid: ∫ab* *f* '(*x*) *dx* = *∫ba* *f* '(*x*) *dx*