

# Integration Using GeoGebra

**Spoken Tutorial Project**

**<http://spoken-tutorial.org>**

**National Mission on Education through ICT**

**<http://sakshat.ac.in>**

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**2 October 2018**



# Learning Objectives



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**Look at integration to estimate,**



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Look at integration to estimate,

- Area Under a Curve (AUC)



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Look at integration to estimate,

- Area Under a Curve (AUC)
- Area bounded by two functions



# System Requirement



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- **Ubuntu Linux OS v 16.04**



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- **GeoGebra 5.0.481.0-d**





# Pre-requisites



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- **GeoGebra interface**



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- **GeoGebra interface**
- **Integration**



# Pre-requisites

- GeoGebra interface
- Integration
- For relevant tutorials, please visit our website

[www.spoken-tutorial.org](http://www.spoken-tutorial.org)



# Definite Integral



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- Area bounded by  $y = f(x)$ ,  $x = a$ ,  $x = b$  and  $x$  axis



# Calculation of a Definite Integral



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- Let us calculate definite integral

$$\int_{-1}^2 (-0.5x^3 + 2x^2 - x + 1)dx$$



# Double Integrals



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- AUC along x and y axes' directions



# Double Integrals

- Double integrals can be used to find
- AUC along  $x$  and  $y$  axes' directions
- Volume under a surface  $z = f(x, y)$



# Double Integral-an Example





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- Area between parabola  $x = y^2$  and the line  $y = x$



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- $\int_0^1 \int_x^{\sqrt{x}} dy dx$



# Summary

**Understand integration as estimation of,**

- **Area Under a Curve (AUC)**
- **Area bounded by two functions**



# Assignment



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- $g(x) = 0.5x^3 + 2x^2 - x - 3.75$



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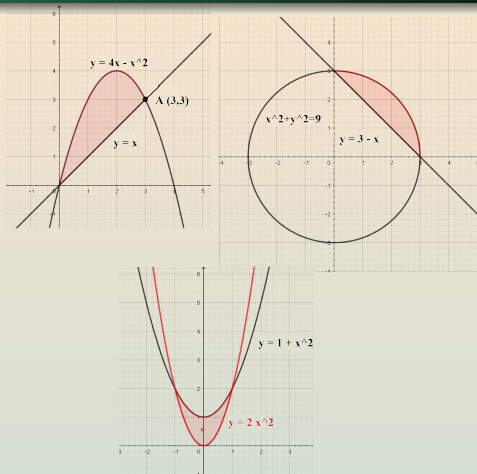
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- Calculate  $\int_{x(A)}^{x(B)} g(x)dx$  and  $\int_{x(B)}^{x(C)} g(x)dx$
- $g(x) = 0.5x^3 + 2x^2 - x - 3.75$
- A, B and C are where curve intersects x axis ( $L \rightarrow R$ ); explain the results



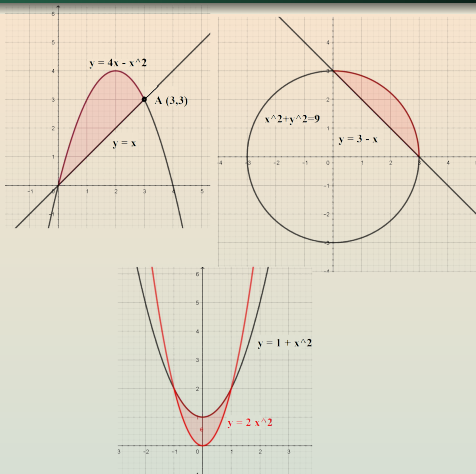
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# Assignment



- Calculate the area bounded by above functions



# About the Spoken Tutorial Project

- Watch the video available at [http://spoken-tutorial.org/What\\_is\\_a\\_Spoken\\_Tutorial](http://spoken-tutorial.org/What_is_a_Spoken_Tutorial)
- It summarizes the Spoken Tutorial project
- If you do not have good bandwidth, you can download and watch it



# Spoken Tutorial Workshops

## The Spoken Tutorial Project Team

- Conducts workshops using spoken tutorials
- Gives certificates to those who pass an online test
- For more details, please write to [contact@spoken-tutorial.org](mailto:contact@spoken-tutorial.org)





# Forum for specific questions

- Do you have questions in **THIS Spoken Tutorial?**
- Please visit <http://forums.spoken-tutorial.org>
- Choose the minute and second where you have the question
- Explain your question briefly
- Someone from our team will answer



# Acknowledgements

- Spoken Tutorial Project is a part of the Talk to a Teacher project
- It is supported by the National Mission on Education through ICT, MHRD, Government of India
- More information on this Mission is available at

<http://spoken-tutorial.org /NMEICT-Intro>

