

Integration Using GeoGebra

Spoken Tutorial Project

<http://spoken-tutorial.org>

National Mission on Education through ICT

<http://sakshat.ac.in>

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Learning Objectives



Learning Objectives

Look at integration to estimate,



Learning Objectives

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**



Pre-requisites

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



Pre-requisites

- **GeoGebra interface**
- **Integration**
- **For relevant tutorials, please visit our website**
www.spoken-tutorial.org



Definite Integral



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- Consider f is a continuous function over interval $[a, b]$ above x axis



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



Calculation of a Definite Integral



Calculation of a Definite Integral

- **Let us calculate definite integral**

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



Double Integrals



Double Integrals

- Double integrals can be used to find



Double Integrals

- Double integrals can be used to find
- **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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- Calculate $\int_0^{0.5} f(x)dx$ where $f(x) = 1/(1 - x)$



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- Calculate $\int_{x(A)}^{x(B)} g(x)dx$ and $\int_{x(B)}^{x(C)} g(x)dx$



Assignment

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- Calculate $\int_{x(A)}^{x(B)} g(x)dx$ and $\int_{x(B)}^{x(C)} g(x)dx$
- $g(x) = 0.5x^3 + 2x^2 - x - 3.75$



Assignment

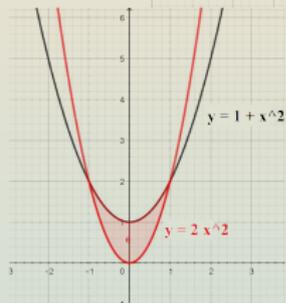
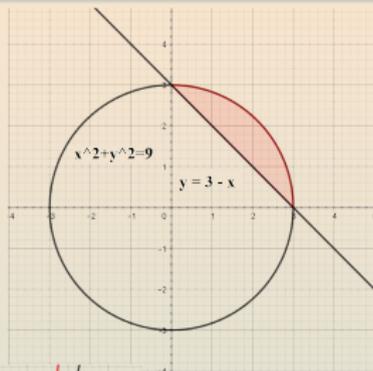
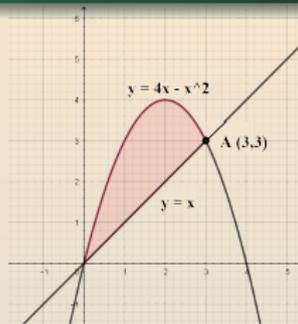
- Calculate $\int_0^{0.5} f(x)dx$ where $f(x) = 1/(1 - x)$
- Calculate $\int_{x(A)}^{x(B)} g(x)dx$ and $\int_{x(B)}^{x(C)} g(x)dx$
- $g(x) = 0.5x^3 + 2x^2 - x - 3.75$
- A, B and C are where curve intersects x axis (L \rightarrow R); explain the results



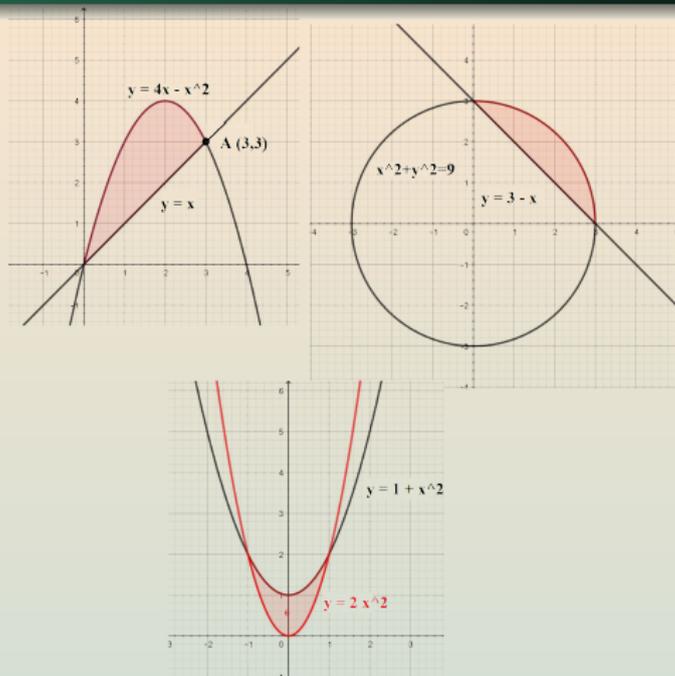
Assignment



Assignment



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
- 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



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

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- More information on this Mission is available at

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

