

Trig Tour

Spoken Tutorial Project

<http://spoken-tutorial.org>

National Mission on Education through ICT

<http://sakshat.ac.in>

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IIT Bombay

1 July 2018



Learning Objectives



Learning Objectives

We will demonstrate,



Learning Objectives

We will demonstrate,

- ▶ **Trig Tour PhET simulation**



System Requirement



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- ▶ **Ubuntu Linux OS v 16.04**



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- ▶ **Java v 1.8.0**



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- ▶ **Ubuntu Linux OS v 16.04**
- ▶ **Java v 1.8.0**
- ▶ **Firefox Web Browser v 60.0.2**



Pre-requisites



Pre-requisites

- ▶ **Learners should be familiar with trigonometry**



Learning Goals



Learning Goals

- ▶ **Construct right triangles for a point moving around a unit circle**



Learning Goals

- ▶ **Construct right triangles for a point moving around a unit circle**
- ▶ **Calculate trigonometric ratios, *cos, sin, tan* of angle θ**



Learning Goals

- ▶ Construct right triangles for a point moving around a unit circle
- ▶ Calculate trigonometric ratios, \cos , \sin , \tan of angle θ
- ▶ Graph θ versus \cos , \sin , \tan functions of θ along x, y axes



Link for PhET Simulation



Link for PhET Simulation

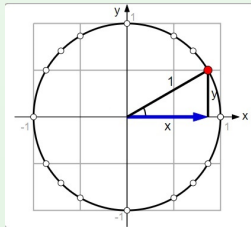
<http://phet.colorado.edu>



Cosine Function



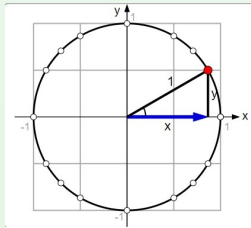
Cosine Function



- Cosine is ratio of lengths of adjacent side to hypotenuse



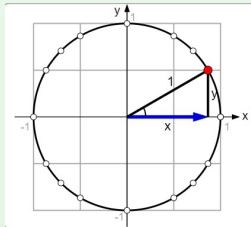
Cosine Function



- ▶ Cosine is ratio of lengths of adjacent side to hypotenuse
- ▶ Cosine is x co-ordinate of a point moving around unit circle



Cosine Function



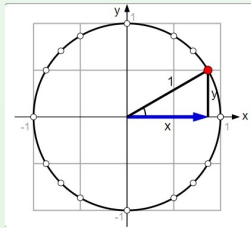
- ▶ Cosine is ratio of lengths of adjacent side to hypotenuse
- ▶ Cosine is x co-ordinate of a point moving around unit circle
- ▶ $\cos(\theta) = x / \text{radius} = x / 1$



Sine Function



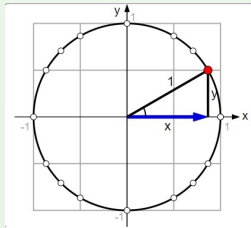
Sine Function



- Sine is ratio of lengths of opposite side to hypotenuse



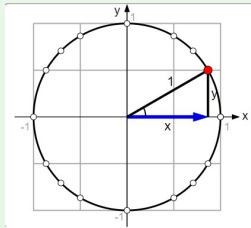
Sine Function



- ▶ Sine is ratio of lengths of opposite side to hypotenuse
- ▶ Sine is y co-ordinate of a point moving around unit circle



Sine Function



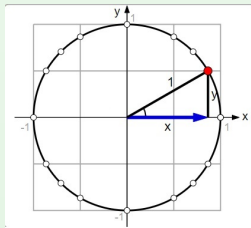
- ▶ Sine is ratio of lengths of opposite side to hypotenuse
- ▶ Sine is y co-ordinate of a point moving around unit circle
- ▶ $\sin(\theta) = y / \text{radius} = y / 1$



Tangent Function



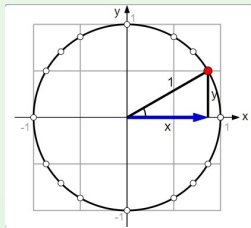
Tangent Function



- Tangent is ratio of lengths of opposite to adjacent sides



Tangent Function



- ▶ Tangent is ratio of lengths of opposite to adjacent sides
- ▶ $\tan(\theta) = \sin(\theta)/\cos(\theta) = y/x$



Summary



Summary

We have demonstrated,



Summary

We have demonstrated,

- ▶ **Trig Tour PhET simulation**



Summary



Summary

- ▶ **Construct right triangles for a point moving around unit circle**
- ▶ **Calculate trigonometric ratios \cos, \sin, \tan of angle θ**
- ▶ **Graph θ versus \cos, \sin, \tan functions of θ along x, y axes**



Assignment



Assignment

Observe:

- ▶ **Cosine, sine and tangent values for all special angles**



Assignment

Observe:

- ▶ Cosine, sine and tangent values for all special angles
- ▶ *Cos, sin, tan* graphs



Assignment

Observe:

- ▶ Cosine, sine and tangent values for all special angles
- ▶ *Cos, sin, tan* graphs
- ▶ Relationship between ratios for supplementary angles (sum of 180 degrees)



About the Spoken Tutorial Project

- ▶ Watch the video available at http://spoken-tutorial.org/What_is_a_Spoken_Tutorial
- ▶ It summarises the Spoken Tutorial project



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- ▶ 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 them



Acknowledgements

- ▶ This project is partially funded by
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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>

