

# Conic Sections - Hyperbola

**Spoken Tutorial Project**

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

**National Mission on Education through ICT**

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

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# Learning Objectives



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**We will,**



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**We will,**

- **Study standard equations and parts of hyperbolae**



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**We will,**

- **Study standard equations and parts of hyperbolae**
- **Learn to use GeoGebra to construct a hyperbola**



# System Requirement



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- **Ubuntu Linux OS v 14.04**



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- **Ubuntu Linux OS v 14.04**
- **GeoGebra 5.0.388.0-d**





# Pre-requisites



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- **GeoGebra interface**



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- **GeoGebra interface**
- **Conic Sections in geometry**



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- **GeoGebra interface**
- **Conic Sections in geometry**
- **For relevant tutorials, please visit our website**

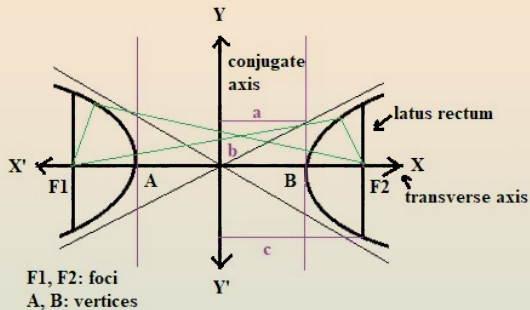
[www.spoken-tutorial.org](http://www.spoken-tutorial.org)



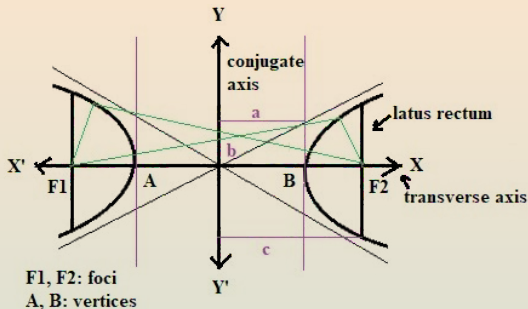
# Hyperbola



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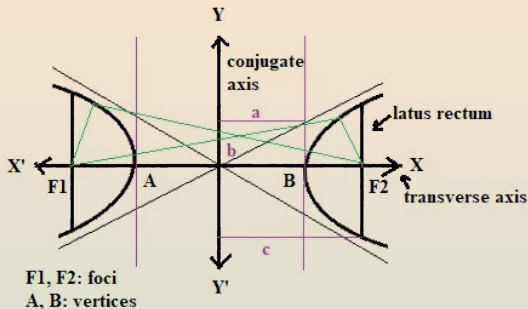
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- Consider two fixed points  $F_1$  and  $F_2$  called foci



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- Consider two fixed points  $F_1$  and  $F_2$  called foci
- A hyperbola is the locus of points whose difference of distances from these foci is constant

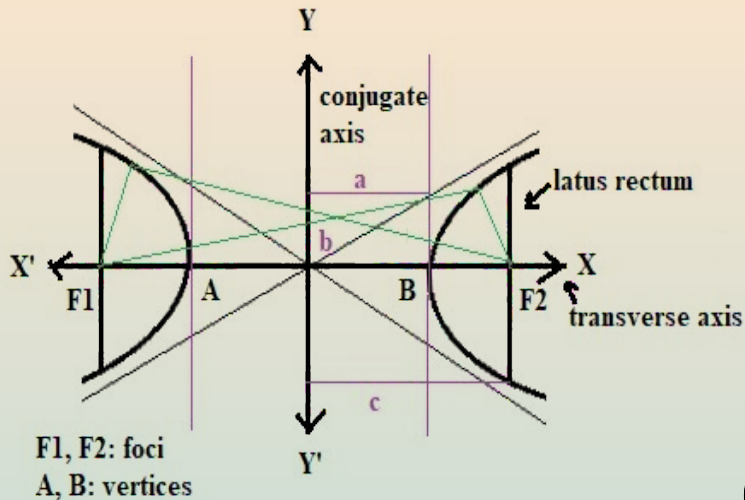




# Hyperbola



# Hyperbola



# Text Box for Hyperbola $c$



# Text Box for Hyperbola c

- Transverse axis  $2a = 4$
- $c = 2.24$
- Conjugate axis  $2b = 2.018$
- $e = 1.12$
- latus rectum  $= 1.018$



# Summary

We have learnt how to use GeoGebra to,

- Construct a hyperbola
- Look at standard equations and parts of hyperbolae



# Assignment



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- Construct hyperbolae with,



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- **Construct hyperbolae with,**
- **Foci  $(\pm 3, 0)$  and vertices  $(\pm 2, 0)$**





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- **Foci  $(0, \pm 5)$  and vertices  $(0, \pm 3)$**



# Assignment

- **Construct hyperbolae with,**
- **Foci  $(\pm 3, 0)$  and vertices  $(\pm 2, 0)$**
- **Foci  $(0, \pm 5)$  and vertices  $(0, \pm 3)$**
- **Find their centres and equations**



# Assignment

- Construct hyperbolae with,
- Foci  $(\pm 3, 0)$  and vertices  $(\pm 2, 0)$
- Foci  $(0, \pm 5)$  and vertices  $(0, \pm 3)$
- Find their centres and equations
- Calculate eccentricity and length of latus recti, transverse and conjugate axes



# Assignment



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- Find the co-ordinates of the foci, vertices and eccentricity



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- Eccentricity and length of transverse, conjugate axes and latus rectum



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- $\frac{x^2}{16} - \frac{y^2}{9} = 1$



# Assignment

- Find the co-ordinates of the foci, vertices and eccentricity
- Eccentricity and length of transverse, conjugate axes and latus rectum
- $\frac{x^2}{16} - \frac{y^2}{9} = 1$
- $49y^2 - 16x^2 = 784$





# 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>

