

11.2: Hyperbolas

“I WILL...

Identify and label all parts of a hyperbola

Convert all general form equations to standard form”

I. Definitions

- A. Hyperbola: Set of points whose differences of the distances from any point to the foci is constant. It has two disconnected branches.
- B. Foci: Segment point joining the vertices given at a point. It is always with the TRANSVERSE axis
- C. Transverse Axis: The line segment joining the vertices.
- D. Conjugate Axis: The minor line segment joining the vertices perpendicular to the transverse axis.
- E. Asymptote: Line that a graph approaches but does not ever intersect. If the lines intersect, it becomes undefined.
- F. Latus Rectum: A line segment the focus and parallel to the directrix.
- G. Eccentricity: Ratio to describe the shape of the conic $e > 1$

II. Horizontal Standard Form:

- A. Horizontal Standard Form Equation: _____
- B. Foci Points: _____
- C. Asymptotes: _____

III. Vertical Standard Form:

- A. Horizontal Standard Form Equation: _____
- B. Foci Points: _____
- C. Asymptotes: _____

IV. All Standard Form Equations:

- A. Center: (h, k)
- B. Length of Transverse Axis: $2a$
- C. Length of Conjugate Axis: $2b$
- D. Foci Equation: $c^2 = a^2 + b^2$
- E. Length of Latus Rectum: $\frac{2b^2}{a}$
- F. Eccentricity: $\frac{c}{a}$

V. Steps of writing Hyperbola Equations

- A. Identify the values of A , B , and C .
- B. Plot/draw the figure with the given information if possible
- C. Write the equation and label the needed information

