



PARKSIDE CHRISTIAN ACADEMY

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Weekly Sheet for HS-2 Algebra II

Mr. Charlton

Week # 11 Dates: November 7, 2011 – November 11, 2011

Topics/Content/Skills:

Topic: Conic Sections: The Hyperbola

Content:

A conic (or conic section) is a plane curve that can be obtained by intersecting a cone with a plane that does not go through the vertex of the cone. There are three possibilities, depending on the relative position of the cone and the plane. **If no line of the cone is parallel to the plane, the intersection is a closed curve, called an ellipse.** If one line of the cone is parallel to the plane, the intersection is an open curve whose two ends are asymptotically parallel; this is called a parabola. Finally, there may be two lines in the cone parallel to the plane; the curve in this case has two open pieces, and is called a hyperbola.

Skills: Students will be able to:

- Define ellipse and hyperbola and label the parts of each conic section
- Define the properties of ellipses and hyperbolas
- Explain Kepler's Laws of Planetary Orbit (optional)
- Understand how the eccentricity of Earth affects the planet

Vocabulary/Key Terms/Formulas:

Vocabulary:

- a. An **absolute value function** has a special characteristic in that the function will not be negative.
- b. A **transformation** changes a graph's size, shape, position, or orientation.
- c. A **translation** is a transformation that shifts a graph horizontally and/or vertically, but does not change its size, shape, or orientation.
- d. A **vertical stretch** occurs when the coefficient of the variable is greater than one.
- e. A **vertical compression** occurs when the coefficient of the variable is less than one.
- f. A **reflection** occurs across the x-axis when the coefficient changes signs from positive to negative or vice versa.
- g. A **Circle** is a round plane figure whose boundary (the circumference) consists of points equidistant from a fixed center.
- h. A **Parabola** is a conic section, the intersection of a right circular conical surface and a plane parallel to a generating straight line of that surface.
- i. An **Ellipse** is a plane curve that results from the intersection of a cone by a plane in a way that produces a closed curve.
- j. A **Locus** is the set of points satisfying certain relations within an Ellipse; within the set of points, consists of the points equidistant from a fixed point, and a fixed line.

Key Terms: All

Formula:

- $\text{Abs}(x) = y$
- $X^2 + Y^2 = r^2$
- $(X-h)^2 + k$ or $Y = ax^2$
- $\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1$
- $\frac{(x-h)^2}{a^2} - \frac{(y-k)^2}{b^2} = 1$

Homework:

| | <u>Lesson</u> | <u>Homework</u> |
|-------------------------|---|---|
| <u>Monday</u> | Review of: <ul style="list-style-type: none">• The Ellipse, Parabola, Circle, and absolute value graphs | Student will: <ul style="list-style-type: none">• Complete handout given in class |
| <u>Tuesday</u> | Lesson: <ul style="list-style-type: none">• The Hyperbola: | Student will: <ul style="list-style-type: none">• Complete handout given in class |
| <u>Wednesday</u> | Lesson: <ul style="list-style-type: none">• The Hyperbola: Polar and Parametric Equations of a Hyperbola | Student will: <ul style="list-style-type: none">• http://www.khanacademy.org/video/conic-sections--intro-to-ellipses?playlist=Algebra• Complete the handout, given in class. |
| <u>Thursday</u> | Lesson: <ul style="list-style-type: none">• The Hyperbola• Practice and review lesson• Take home assignment: Introduction | Students will: <ul style="list-style-type: none">• Complete handout |
| <u>Friday</u> | Lesson: <ul style="list-style-type: none">• No class for HS2 | Students will: <ul style="list-style-type: none">• No Class |

Tests:

NA

Special Events/News:

NA

Extra-ordinaries/Mastery Review Material:

Answer the Following:

- $Y^2+X^2 =9$ •
 - $Y^2+X^2 =16$ •
 - $Y^2+X^2 =25$ •
 - $Y^2+X^2 =36$ •
 - $Y^2+X^2 =49$ •
- What is the radius of the circles on the left? •

Equation of Circle in Standard Form

- $(y-3)^2+(X-1)^2 =9$
 - $(y-5)^2+(X-14)^2 =16$
 - $(y-1)^2+(X-5)^2 =25$
 - $(X+2)^2+(y-12)^2 =36$
 - $(y+7)^2+(X +5)^2 =49$
 - $(X +8)^2+(y+17)^2 =49$
- What is the center and radius of each circle to the left?