Vocabulary: Hyperbolas

📖 **Vocabulary**

- <u>Asymptote</u> – a line that a curve approaches as the curve goes to infinity.

  - A hyperbola has two asymptotes that intersect at the center.

- <u>Conic section</u> – a curve formed by the intersection of a plane and one or two right circular cones.

  - For example, the intersection of the plane and the two cones shown to the right is a hyperbola.

  - Parabolas, hyperbolas, ellipses, and circles (which are special ellipses) are all conic sections.
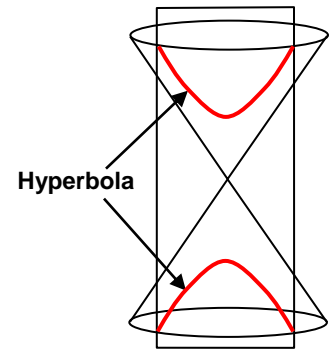
- <u>Foci of a hyperbola (focus points)</u> – the two fixed points, located on the line that contains the transverse axis, that define a hyperbola.
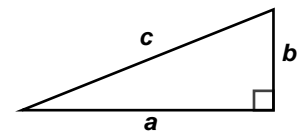
  - The absolute value of the difference of the distances from any point on a hyperbola to the foci is constant and equal to 2a.

- <u>Hyperbola</u> – the set of all points in a plane for which the absolute value of the difference of the distances from two fixed points, the foci, is constant.

  - $|L_1 - L_2| = 2a$, where a is the distance from the center to either of the vertices.
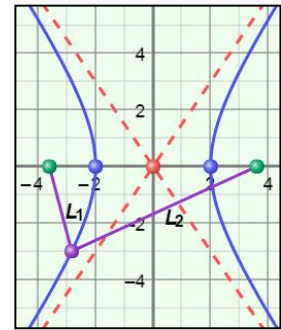
- <u>Pythagorean Theorem</u> – a theorem stating that, for any right triangle, $a^2 + b^2 = c^2$, where a and b are the lengths of the legs of the triangle and c is the length of the hypotenuse.

- <u>Standard form of the equation of a hyperbola</u> – the equation representing a set of points in the coordinate plane for which the absolute value of the difference of the distances from two fixed points, the foci, is constant.

  - If the hyperbola opens horizontally, standard form is $\dfrac{(x-h)^2}{a^2} - \dfrac{(y-k)^2}{b^2} = 1$.

  - If the hyperbola opens vertically, standard form is $\dfrac{(y-k)^2}{a^2} - \dfrac{(x-h)^2}{b^2} = 1$.

  - In either case, the point (h, k) is the center of the hyperbola.

- <u>Transverse axis</u> – the line segment through the center of a hyperbola with endpoints at the vertices.

- <u>Vertices of a hyperbola</u> – the point on each branch of a hyperbola closest to the center.