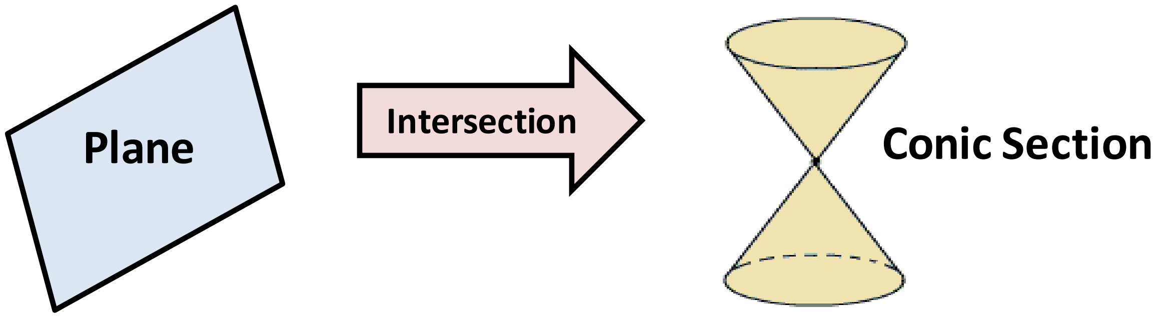
Name: ______________________________ Period: __________ Date: ______________

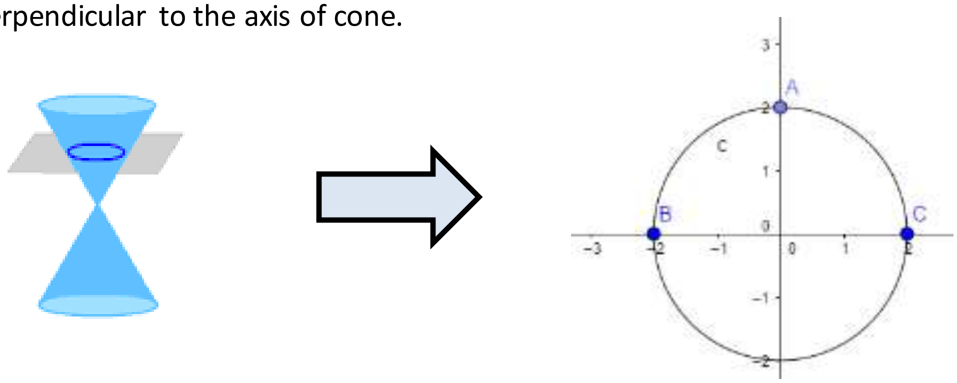
EXPLORING CONIC SECTIONS Guided Notes

A **Conic Section** is a curve formed by the intersection of a plane and a double cone.



By the intersection of this plane and the conic section, we can have a **circle**, an **ellipse**, a **parabola** or a **hyperbola**.

A **Circle** is a curve formed by the intersection of a plane and a double cone such that the plane is perpendicular to the axis of cone.



Circle

General equation: $(x-h)^2+(y-k)^2=r^2$

(h,k) is the center of the circle.

Problem 1: Write the equation of circle whose center is at the origin.

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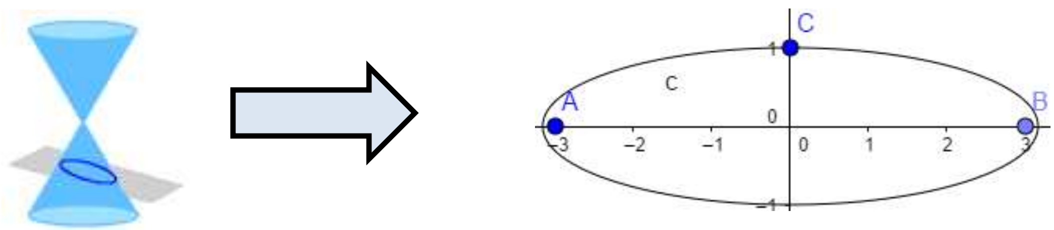
EXPLORING CONIC SECTIONS Guided Notes

An **Ellipse** is a curve formed by the intersection of a plane and a double cone such that the plane cuts the cone at an angle.



Ellipse

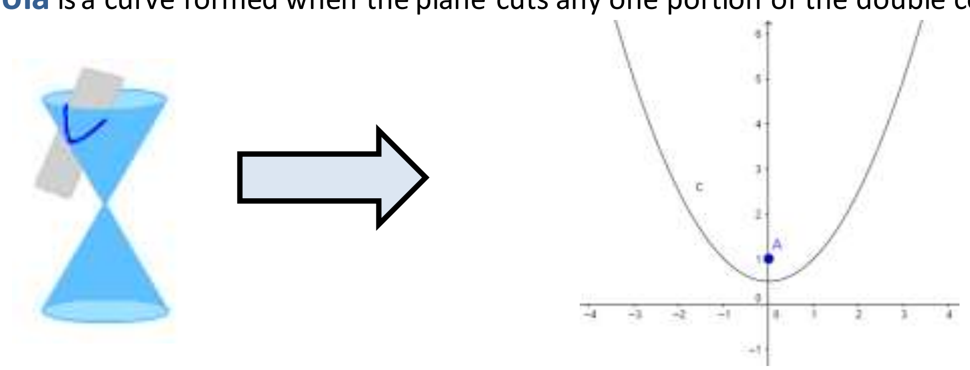
General equations:

$$\frac{(x-h)^2}{a^2}+\frac{(y-k)^2}{b^2}=1$$ **(Horizontal Ellipse)**

$$\frac{(x-h)^2}{b^2}+\frac{(y-k)^2}{a^2}=1$$ **(Vertical Ellipse)**

Problem 2: Write the equation of a horizontal ellipse whose center is at the origin.

A **Parabola** is a curve formed when the plane cuts any one portion of the double cone at angle.



Parabola

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EXPLORING CONIC SECTIONS Guided Notes

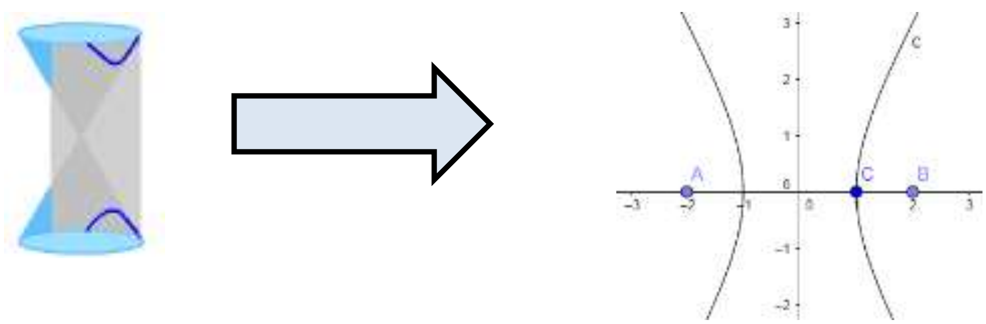
General equations:

$(y-k)^2 = 4a(x-h)$ **(Horizontal Parabola)**

$(x-h)^2 = 4a(y-k)$ **(Vertical Parabola)**

Problem 3: Write the equation of a vertical parabola whose center is at the origin.

A **Hyperbola** is a curve formed when the plane is parallel to the axis of the double cone and cuts both cones.



Hyperbola

General equations:

$$\frac{(x-h)^2}{a^2} - \frac{(y-k)^2}{b^2} = 1$$ **(Horizontal parabola)**

$$\frac{(y-k)^2}{a^2} - \frac{(x-h)^2}{b^2} = 1$$ **(Vertical parabola)**