**Supplementary Activities**

**Unit 5 Investigation 8**

**Ellipses**

Open the file: <http://tube.geogebra.org/material/simple/id/2605483>

Recall that an ellipse is a locus (set) of points in the plane for which the **sum** of the distances from two fixed points, called foci, remains constant.   In the applet, feel free to adjust the **black siders** and the location of *P,* the **brown point (*x*,*y*)** on the ellipse, before dragging the blue slider.

1. What segment has length equal to this **special sum**?
2. Does the special sum depend upon the location of *P* (as long as it is on the ellipse)?
3. How do the sliders *a* and *b* affect the shape of the ellipse? (Note: When the major axis is horizontal *a* must be greater than *b*; the two black sliders do not necessarily have the same scale.)
4. What can you do to make the ellipse become a circle?

**Hyperbolas**

Open the file: <http://tube.geogebra.org/material/simple/id/2605539>

Recall that a hyperbola is a locus (set) of points in the plane for which the **difference** of the distances from two fixed points, called foci, remains constant.   In the applet, feel free to adjust the **black siders** and the location of *P*, the **brown point (*x*,*y*)** on the hyperbola before dragging the blue slider.

1. What segment has length equal to this **special difference**?
2. Does the special difference depend upon the location of *P* (as long as it is on the hyperbola)?
3. How do the sliders *a* and *b* affect the shape of the hyperbola?