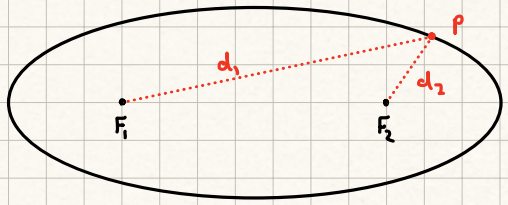
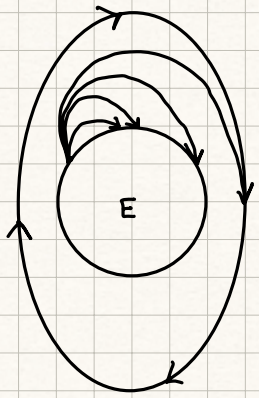
4. **Ellipse** – the locus of points such that the sum of the distances from two given points (foci) is constant.



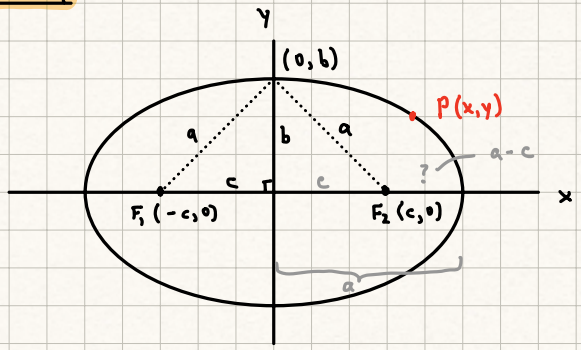
$d_1 + d_2 = C$

① **Whis Carns?** angle that $\overline{F_1 P}$ makes w/ the ellipse is congruent to angle $\overline{F_2 P}$ makes w/ ellipse

- Whispering chamber
- Lithotripter
- Newton –



② **Analytic Geometry** –



Length of String = 2a = constant

$2? + 2c = 2a$

$2? = 2a - 2c$

$? = a - c$

$$a^2 = b^2 + c^2$$

$$\boxed{c^2 = a^2 - b^2}$$

$$\boxed{\text{Length of Strap} = 2a}$$

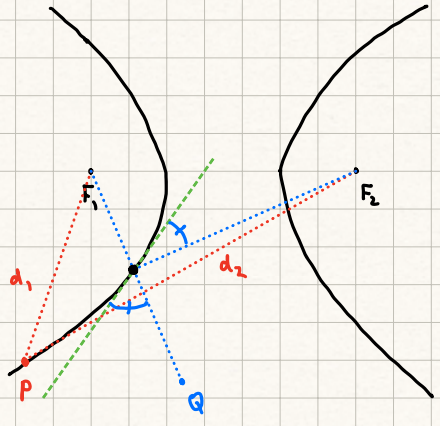
$$d(F_1, P) + d(F_2, P) = 2a$$

$$\sqrt{(x+c)^2 + y^2} + \sqrt{(x-c)^2 + y^2} = 2a$$

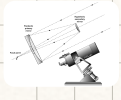
$$\vdots$$

$$\boxed{\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1}$$

5. **Hyperbola** — the locus of points such that difference of the distances from point to each focus is constant.



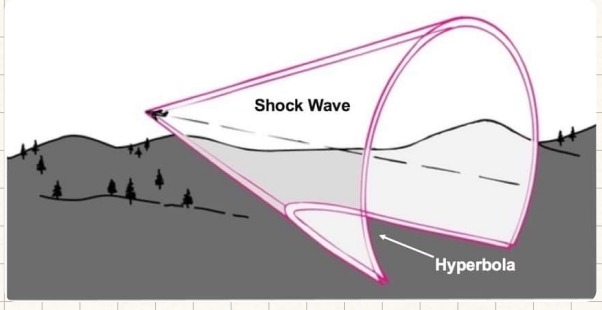
$d_2 - d_1 = \text{constant}$



① **Who Cares?**

- Lamp Shade Shadow

- Sonic Boom



- Conic