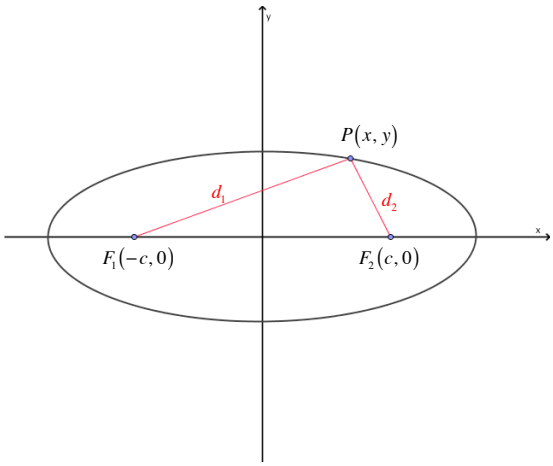
$$d_1(P,F_1)+d_2(P,F_2)=2a$$



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

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

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

$$(x-c)^2+y^2=4a^2-4a\sqrt{(x+c)^2+y^2}+(x+c)^2+y^2$$

$$x^2-2cx+c^2+y^2=4a^2-4a\sqrt{(x+c)^2+y^2}+x^2+2cx+c^2+y^2$$

$$-4cx=4a^2-4a\sqrt{(x+c)^2+y^2}$$

$$4a\sqrt{(x+c)^2+y^2}=4a^2+4cx$$

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

$$\left[a\sqrt{(x+c)^2+y^2}\right]^2=\left(a^2+cx\right)^2$$

$$a^2\left[(x+c)^2+y^2\right]=a^4+2a^2cx+c^2x^2$$

$$a^2x^2+2a^2cx+a^2c^2+a^2y^2=a^4+2a^2cx+c^2x^2$$

$$a^2x^2-c^2x^2+a^2y^2=a^4-a^2c^2$$

$$\left(a^2-c^2\right)x^2+a^2y^2=a^2\left(a^2-c^2\right)$$

$$\frac{\left(a^2-c^2\right)x^2}{a^2\left(a^2-c^2\right)}+\frac{a^2y^2}{a^2\left(a^2-c^2\right)}=\frac{a^2\left(a^2-c^2\right)}{a^2\left(a^2-c^2\right)}$$

$$\frac{x^2}{a^2}+\frac{y^2}{\left(a^2-c^2\right)}=1$$

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

Phil Gonsalves 03/01/12