

Find the equation of the ellipse where the sum of the distances from  $F(-c, 0)$  and  $F'(c, 0)$  is  $2a$ .

두 초점  $F(c, 0)$  이고  $F'(-c, 0)$  으로부터 거리의 합이  $2a$ 인 타원의 방정식을 구하여라.

(Find the equation of the ellipse where the sum of the distances from  $F(-c, 0)$  and  $F'(c, 0)$  is  $2a$ .)

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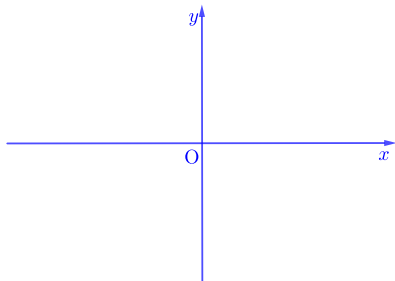
▶ Start

▶ End

Find the equation of the ellipse where the sum of the distances from  $F(-c, 0)$  and  $F'(-c, 0)$  is  $2a$ .

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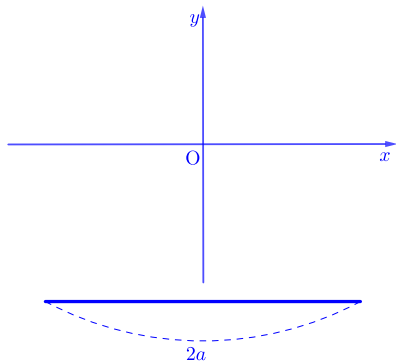
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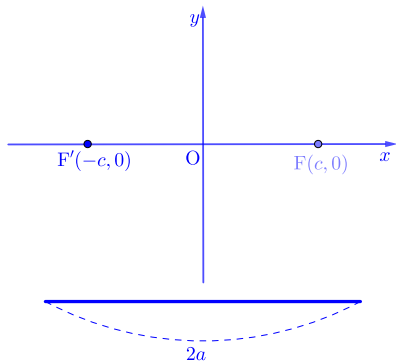
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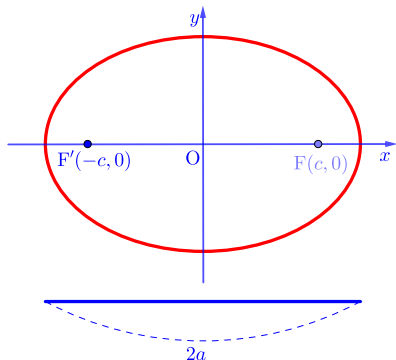
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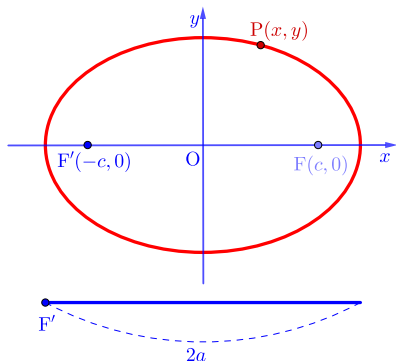




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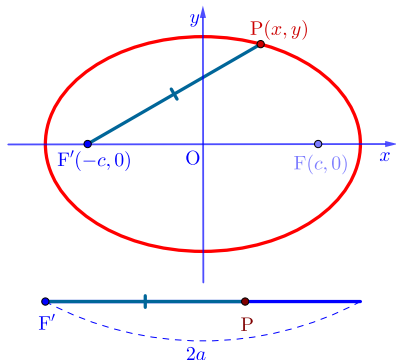




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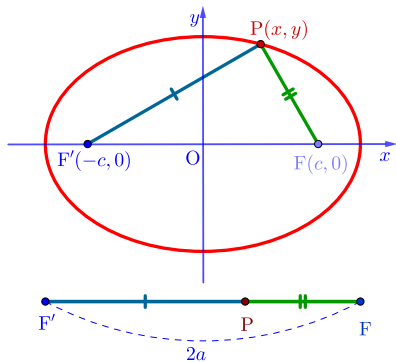
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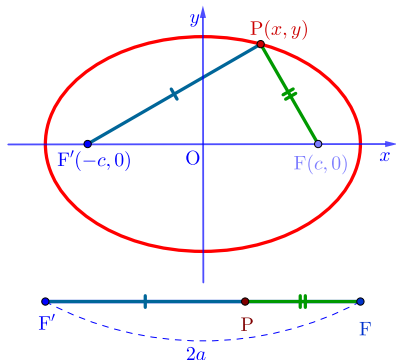


Find the equation of the ellipse where the sum of the distances from  $F(-c, 0)$  and  $F'(c, 0)$  is  $2a$ .

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$$\overline{PF} + \overline{PF'} = 2a$$



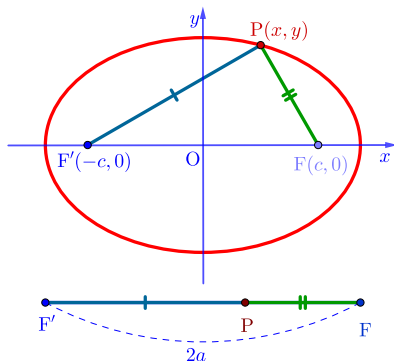
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$$\sqrt{(x-c)^2 + (y-0)^2} + \sqrt{(x-(-c))^2 + (y-0)^2} = 2a$$



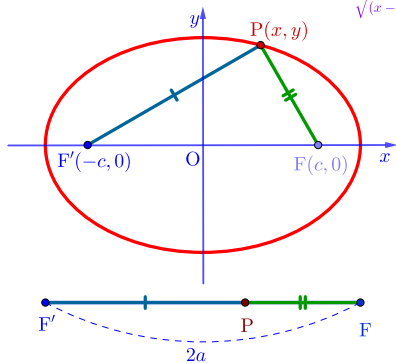
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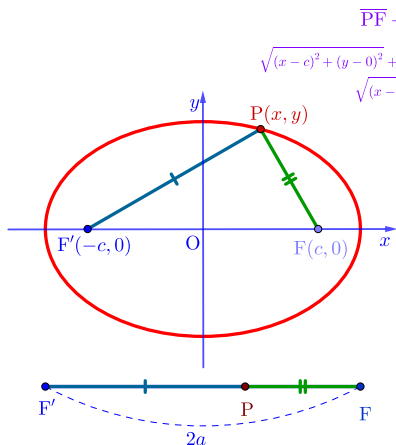
$$\sqrt{(x-c)^2 + (y-0)^2} + \sqrt{\{x-(-c)\}^2 + (y-0)^2} = 2a$$
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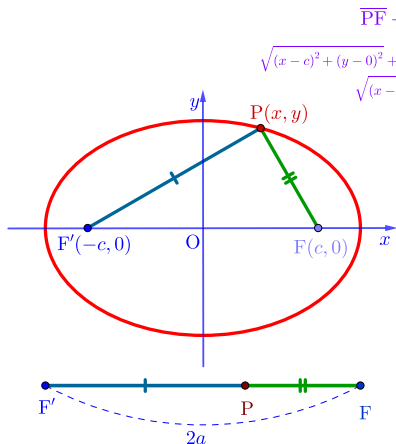
$$\sqrt{(x-c)^2 + y^2} + \sqrt{(x+c)^2 + y^2} = 2a$$

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

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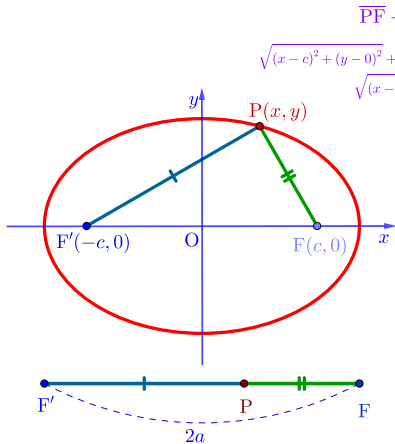
$$\sqrt{(x-c)^2 + y^2} = 2a - \sqrt{(x+c)^2 + y^2}$$

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

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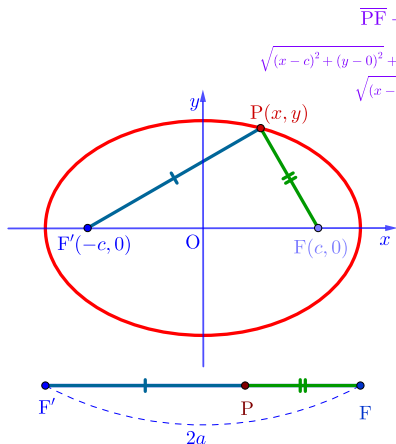
$$(x-c)^2 = 4a^2 - 4a\sqrt{(x+c)^2 + y^2} + (x+c)^2$$



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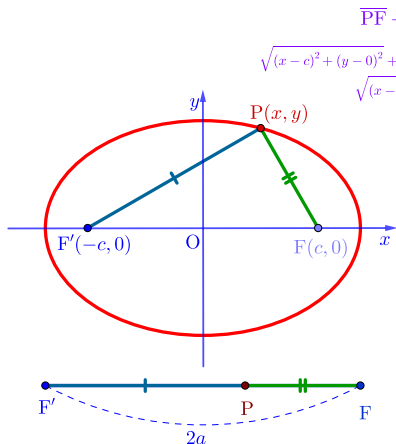
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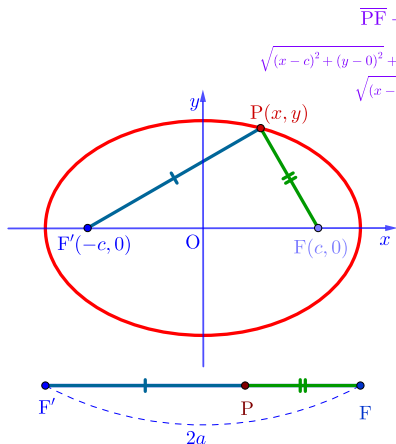
$$4a\sqrt{(x+c)^2 + y^2} = 4a^2 + (x+c)^2 - (x-c)^2$$

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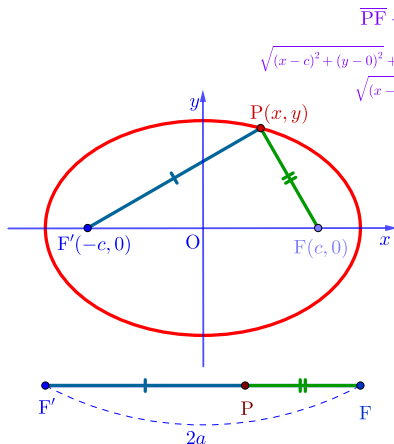
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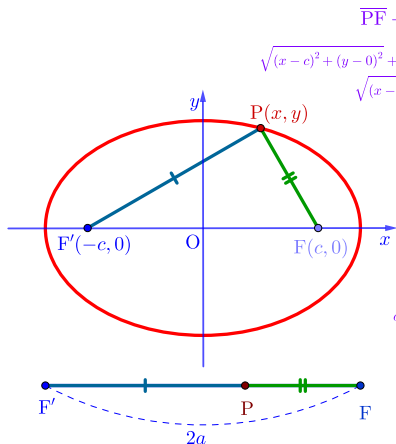
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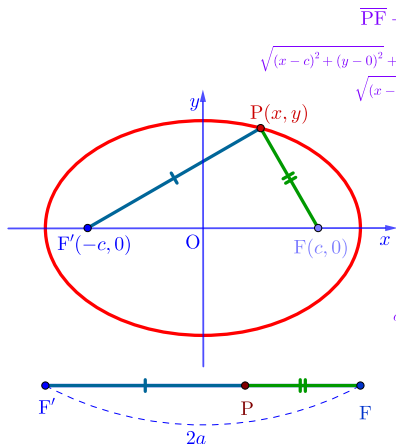
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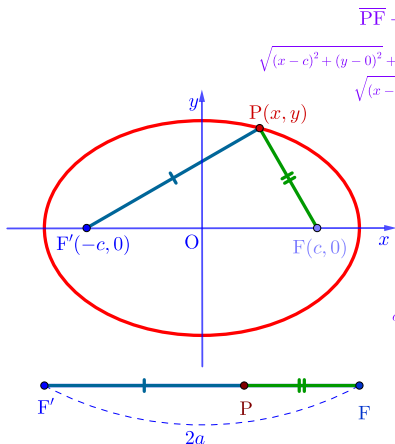
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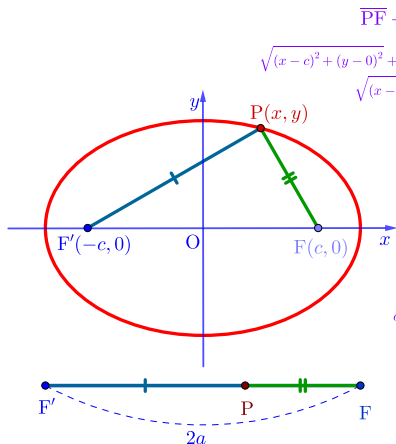




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$$a^2x^2 + a^2c^2 + a^2y^2 = a^4 + c^2x^2$$

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

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

$$\text{Let } b^2 = a^2 - c^2 \quad b^2x^2 + a^2y^2 = a^2b^2$$

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



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Github:

<https://min7014.github.io/math20200422001.html>

Click or paste URL into the URL search bar,  
and you can see a picture moving.