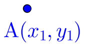
# 아폴로니우스의 원
(Circle of Apollonius)

# Circle of Apollonius

Start End

Start End



# Circle of Apollonius



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Start End

$$\overline{\mathrm{AP}} : \overline{\mathrm{BP}} = 1 : r \quad (0 < r < 1)$$

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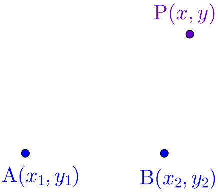

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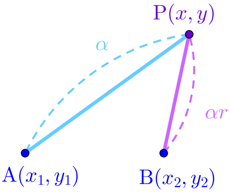

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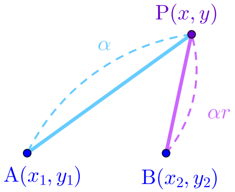
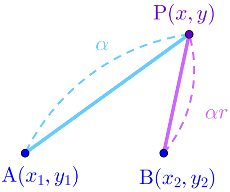
$$\overline{\mathrm{BP}} = r\overline{\mathrm{AP}}$$



Start End

$$\overline{\mathrm{AP}} : \overline{\mathrm{BP}} = 1 : r \quad (0 < r < 1)$$

$$\sqrt{(x - x_2)^2 + (y - y_2)^2} = r\sqrt{(x - x_1)^2 + r^2(y - y_1)^2}$$



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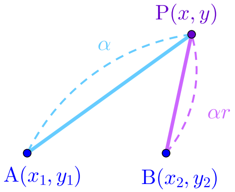
$\overline{\mathrm{AP}} : \overline{\mathrm{BP}} = 1 : r \quad (0 < r < 1)$

$$(x - x_2)^2 + (y - y_2)^2 = r^2(x - x_1)^2 + r^2(y - y_1)^2$$



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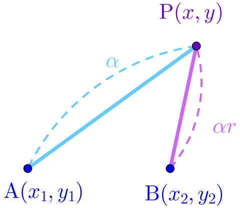
$$\overline{\mathrm{AP}} : \overline{\mathrm{BP}} = 1 : r$$

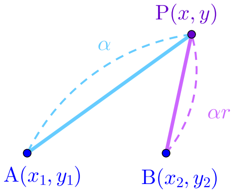
$$\left(x - \frac{x_2 - x_1 r^2}{1 - r^2}\right)^2 + \left(y - \frac{y_2 - y_1 r^2}{1 - r^2}\right)^2 = \frac{\left\{(x_1 - x_2)^2 + (y_1 - y_2)^2\right\} r^2}{(1 - r^2)^2}$$



Start End

$$\overline{\mathrm{AP}} : \overline{\mathrm{BP}} = 1 : r \quad (0 < r < 1)$$

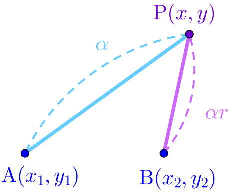
$$(1-r^2)x^2 + (1-r^2)y^2 - 2(x_2 - x_1r^2)x - 2(y_2 - y_1r^2)y + (x_2^2 + y_2^2 - x_1^2r^2 - y_1^2r^2) = 0$$



Start End

$$\overline{\mathrm{AP}} : \overline{\mathrm{BP}} = 1 : r \quad (0 < r < 1)$$

$$x^2 + y^2 - 2\frac{x_2 - x_1 r^2}{1 - r^2}x - 2\frac{y_2 - y_1 r^2}{1 - r^2}y + \frac{x_2^2 + y_2^2 - r^2 x_1^2 - r^2 y_1^2}{1 - r^2} = 0$$

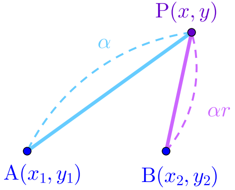


Start End

$$\overline{\mathrm{AP}} : \overline{\mathrm{BP}} = 1 : r \quad (0 < r < 1)$$

$$\left(x - \frac{x_2 - x_1 r^2}{1 - r^2}\right)^2 + \left(y - \frac{y_2 - y_1 r^2}{1 - r^2}\right)^2$$

$$= \left(\frac{x_2 - x_1 r^2}{1 - r^2}\right)^2 + \left(\frac{y_2 - y_1 r^2}{1 - r^2}\right)^2 - \frac{x_2^2 + y_2^2 - r^2 x_1^2 - r^2 y_1^2}{1 - r^2}$$

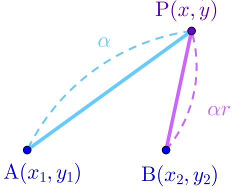


Start End

$$\overline{\mathrm{AP}} : \overline{\mathrm{BP}} = 1 : r \quad (0 < r < 1)$$

$$\left(x - \frac{x_2 - x_1 r^2}{1 - r^2}\right)^2 + \left(y - \frac{y_2 - y_1 r^2}{1 - r^2}\right)^2$$

$$= \frac{(x_2 - x_1 r^2)^2 + (y_2 - y_1 r^2)^2 - (x_2^2 + y_2^2 - r^2 x_1^2 - r^2 y_1^2)(1 - r^2)}{(1 - r^2)^2}$$



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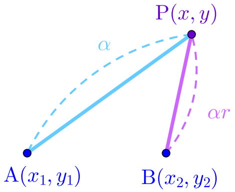
$$\overline{\mathrm{AP}} : \overline{\mathrm{BP}} = 1 : r \quad (0 < r < 1)$$

$$\left(x - \frac{x_2 - x_1 r^2}{1 - r^2}\right)^2 + \left(y - \frac{y_2 - y_1 r^2}{1 - r^2}\right)^2$$

$$= \frac{x_2^2 - 2x_1x_2r^2 + x_1^2r^4 + y_2^2 - 2y_1y_2r^2 + y_1^2r^4 - (x_2^2 + y_2^2 - x_1^2r^2 - y_1^2r^2)(1 - r^2)}{(1 - r^2)^2}$$



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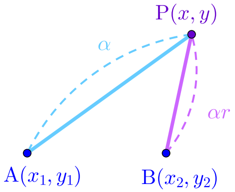
$$\overline{\mathrm{AP}} : \overline{\mathrm{BP}} = 1 : r \quad (0 < r < 1)$$

$$\left(x - \frac{x_2 - x_1 r^2}{1 - r^2}\right)^2 + \left(y - \frac{y_2 - y_1 r^2}{1 - r^2}\right)^2$$

$$= \frac{x_2^2 - 2x_1x_2r^2 + x_1^2r^4 + y_2^2 - 2y_1y_2r^2 + y_1^2r^4 - x_2^2 - y_2^2 + x_1^2r^2 + y_1^2r^2 + x_2^2r^2 + y_2^2r^2 - x_1^2r^4 - y_1^2r^4}{(1 - r^2)^2}$$



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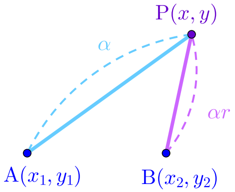
$$\overline{\mathrm{AP}} : \overline{\mathrm{BP}} = 1 : r \quad (0 < r < 1)$$

$$\left(x - \frac{x_2 - x_1 r^2}{1 - r^2}\right)^2 + \left(y - \frac{y_2 - y_1 r^2}{1 - r^2}\right)^2 = \frac{-2x_1x_2r^2 - 2y_1y_2r^2 + x_1^2r^2 + y_1^2r^2 + x_2^2r^2 + y_2^2r^2}{(1 - r^2)^2}$$



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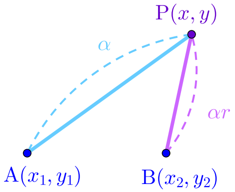
$$\left(x - \frac{x_2 - x_1 r^2}{1 - r^2}\right)^2 + \left(y - \frac{y_2 - y_1 r^2}{1 - r^2}\right)^2 = \frac{x_1^2 r^2 - 2x_1 x_2 r^2 + x_2^2 r^2 + y_1^2 r^2 - 2y_1 y_2 r^2 + y_2^2 r^2}{(1 - r^2)^2}$$



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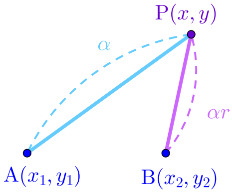
$$\left(x - \frac{x_2 - x_1 r^2}{1 - r^2}\right)^2 + \left(y - \frac{y_2 - y_1 r^2}{1 - r^2}\right)^2 = \frac{(x_1^2 - 2x_1x_2 + x_2^2)r^2 + (y_1^2 - 2y_1y_2 + y_2^2)r^2}{(1 - r^2)^2}$$



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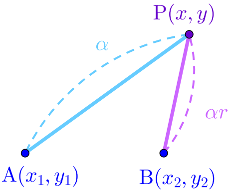
$$\overline{\mathrm{AP}} : \overline{\mathrm{BP}} = 1 : r \quad (0 < r < 1)$$

$$\left(x - \frac{x_2 - x_1 r^2}{1 - r^2}\right)^2 + \left(y - \frac{y_2 - y_1 r^2}{1 - r^2}\right)^2 = \frac{(x_1 - x_2)^2 r^2 + (y_1 - y_2)^2 r^2}{(1 - r^2)^2}$$



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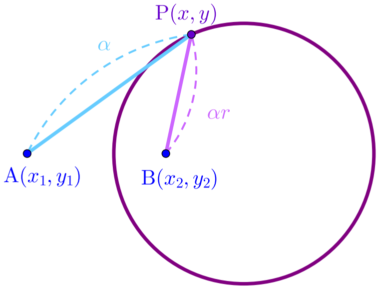
$$\left(x - \frac{x_2 - x_1 r^2}{1 - r^2}\right)^2 + \left(y - \frac{y_2 - y_1 r^2}{1 - r^2}\right)^2 = \frac{(x_1 - x_2)^2 r^2 + (y_1 - y_2)^2 r^2}{(1 - r^2)^2}$$



Github:
https://min7014.github.io/math20210915001.html

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