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\text{Let } \alpha^2 = k^2 - b^2 \\
\therefore \frac{x^2}{\alpha^2} - \frac{y^2}{b^2} = -1
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The equation of the hyperbola is given by:

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Github:
https://min7014.github.io/math20200610001.html

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