Steps to Graph Parabolas:

Vertical Parabola $(x-h)^2 = 4p(y-k)$ or $y = \frac{1}{4p}(x-h)^2 + k$

1) Identify the vertex (h, k) and graph the point.
2) Find the value of p in the equation. (Hint: solve $4p =$)
3) Plot the focus point p units above the vertex.
4) Plot the directrix line p units below the vertex.
   (Note: if p is negative, flip the focus to be below and the directrix above.)
5) Find two key points by counting $2p$ units to the right and left of the focus.
   (Note: these will also be $2p$ units above/below the directrix.
6) Graph the parabola through the vertex and two key points.

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Horizontal Parabola $x = \frac{1}{4p}(y-k)^2 + h$ or $(y-k)^2 = 4p(x-h)$

1) Identify the vertex (h, k) and graph the point.
2) Find the value of p in the equation. (Hint: solve $4p =$)
3) Plot the focus point p units to the right of the vertex.
4) Plot the directrix line p units to the left of the vertex.
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Horizontal Parabola $x = \frac{1}{4p}(y-k)^2 + h$ or $(y-k)^2 = 4p(x-h)$

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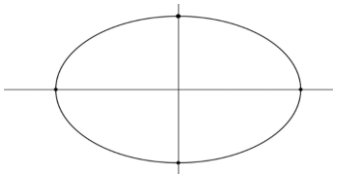
Steps to Graph Horizontal Ellipses:

$$\frac{(x-h)^2}{a^2}+\frac{(y-k)^2}{b^2}=1$$



1) Identify the center (h, k) and graph the point.
2) Identify *a* and *b*.
3) Count left and right ***a*** units from the center and mark the vertices.
4) Count up and down ***b*** units from the center and mark the co-vertices.
5) Draw the ellipse.
6) To find the foci: Calculate the length *c* using $\boldsymbol{c^2=a^2-b^2}$**.** Count *c* units left and right of the center, and mark the points.

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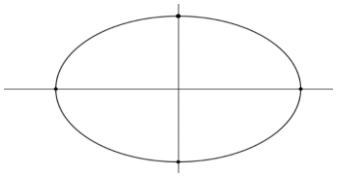

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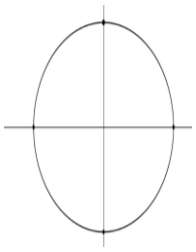

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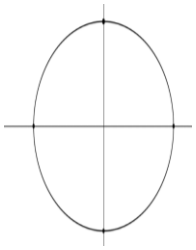

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