

Alternate description of the conic sections.

Take any fixed point  $F$  in the plane  
and any line  $D$  not passing thru  $F$ .

Choose a positive real number  $k$ ,  
 $0 < k < +\infty$ . The set of all points  $P$

with the property  $\frac{\text{dist}(PF)}{\text{dist}(PD)} = k$

is a conic section.

When  $0 < k < 1$ , it is an ellipse.

When  $k = 1$ , it is a parabola.

When  $k > 1$ , it is a hyperbola (just one sheet).