

ON DEFINING A HYPERBOLA

Mangho Ahuja

Southeast Missouri State University

The most common definitions of the hyperbola uses one of the following two approaches.

1. Given a fixed line ℓ and a fixed point F , if a point P moves such that the ratio $\frac{\text{distance of } P \text{ to } F}{\text{distance of } P \text{ to } \ell}$ is a constant greater than 1, then the locus of P is a hyperbola. The line ℓ and the point F act as directrix and focus respectively. The ratio is the eccentricity e of the hyperbola.
2. Given two fixed points F_1 and F_2 , if a point P moves such that the difference $|PF_1 - PF_2|$ is a constant, then the locus of P is a hyperbola. The fixed points F_1 and F_2 are the foci of the curve.

In this paper we will show a different way of defining the hyperbola. We will also show that with a slight modification, this approach can be used to define an ellipse as well. We certainly do not claim that the definition given here is in any way better than, or superior to the classical definitions mentioned above. We leave