Class Discussion

Unit 9 Topic 3 Part 2 Classify Conics

Conics	characteristics
circle: $(x-h)^2+(y-k)^2=r^2$	center radius
parabola: $4c(x-h)=(y-k)^2$ $4c(y-k)=(x-h)^2$	vertex focus axis of symmetry directrix
ellipse: $\frac{(x-h)^2}{a^2}+\frac{(y-k)^2}{b^2}=1$ $\frac{(x-h)^2}{b^2}+\frac{(y-k)^2}{a^2}=1$	vertices covertices center major/minor axis foci eccentricity
hyperbola: $\frac{(x-h)^2}{a^2}-\frac{(y-k)^2}{b^2}=1$ $-\frac{(x-h)^2}{b^2}+\frac{(y-k)^2}{a^2}=1$	center transverse axis vertices foci asymptotes

Ex 1: classify the following conics

(1) $4y^2-2x^2-4y-8x-15=0$

(2) $x^2+4y^2-6x+16y+21=0$

Ex 2: find the hyperbola

(1) vertices: (1,2), (1,-2), passes through $(0,\sqrt{5})$

(2) focus $F(2,-3-\sqrt{10})$, asymptotes $x-3y=11, x+3y=-7$