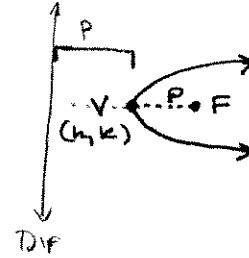
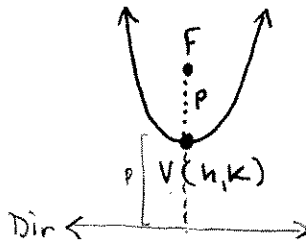
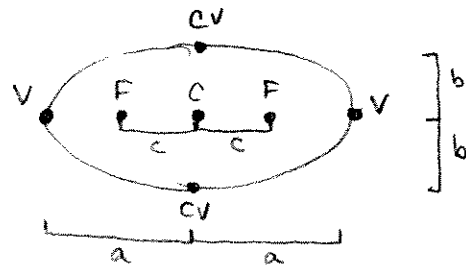
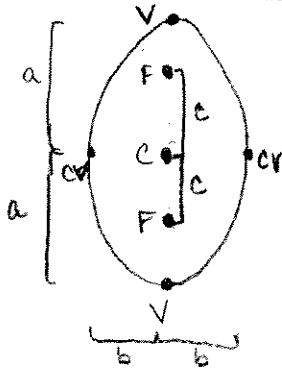


Conic sections formula sheet:

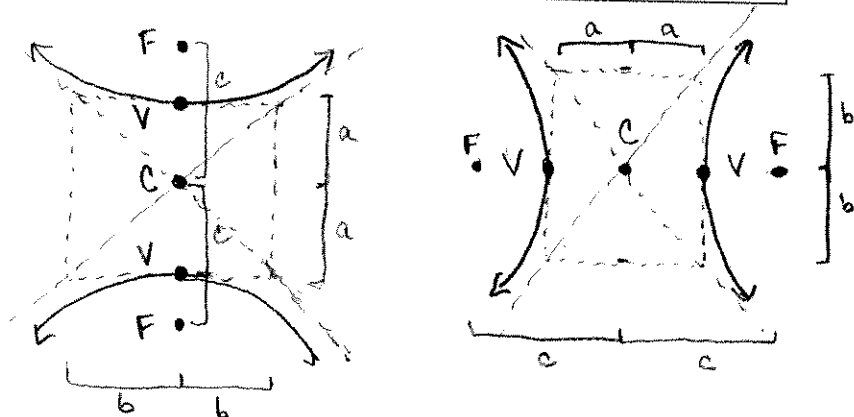
Parabola Information	$x^2 = 4py$	$y^2 = 4px$
	Vertical Axis	Horizontal axis
equation	$(x-h)^2 = 4p(y-k)$	$(y-k)^2 = 4p(x-h)$
Axis of symmetry	$x=h$	$y=k$
Vertex	(h,k)	(h,k)
Focus	$(h,k+p)$	$(h+p,k)$
Directrix	$y=k-p$	$x=h-p$
Direction of opening	$p>0$ then up; $p<0$ then down	$p>0$ then right; $p<0$ then left



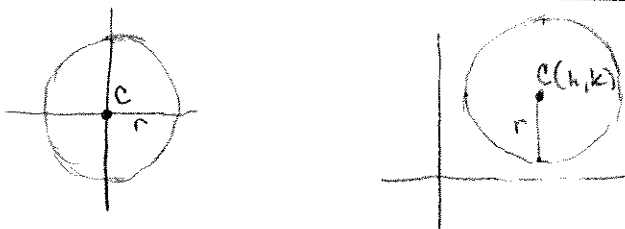
Ellipse Information	Vertical Major Axis	Horizontal Major axis
Equation (Center (0, 0))	$\frac{x^2}{b^2} + \frac{y^2}{a^2} = 1$	$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$
Equation (Center (h, k))	$\frac{(x-h)^2}{b^2} + \frac{(y-k)^2}{a^2} = 1$	$\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1$
center	(h,k)	(h,k)
Vertices	$(h,k \pm a)$	$(h \pm a, k)$
Foci	$(h,k \pm c)$	$(h \pm c, k)$
Equation that relates a, b, and c	$a^2 = b^2 + c^2$	



Hyperbola Information		
	Vertical Transverse Axis	Horizontal Transverse axis
Equation C(0, 0)	$\frac{y^2}{a^2} - \frac{x^2}{b^2} = 1$	$\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$
Equation C(h, k)	$\frac{(y-k)^2}{a^2} - \frac{(x-h)^2}{b^2} = 1$	$\frac{(x-h)^2}{a^2} - \frac{(y-k)^2}{b^2} = 1$
center	(h,k)	(h,k)
Vertices	(h,k±a)	(h±a,k)
Foci	(h,k±c)	(h±c,k)
Asymptote equation	$y = k \pm \frac{a}{b}(x-h)$	$y = k \pm \frac{b}{a}(x-h)$
Equation relating a, b, and c	$c^2 = a^2 + b^2$	



Circle Information	Centered at (0, 0)	Centered at (h, k)
equation	$x^2 + y^2 = r^2$	$(x-h)^2 + (y-k)^2 = r^2$
radius	Radius = r	Radius = r



<u>Classifying conic sections</u>	<u>Circles</u>	<u>Parabola</u>	<u>Ellipse</u>	<u>Hyperbola</u>
$Ax^2 + Cy^2 + Dx + Ey + F = 0$	$A=C$	$AC=0$, Both are not 0	$AC > 0$	$AC < 0$