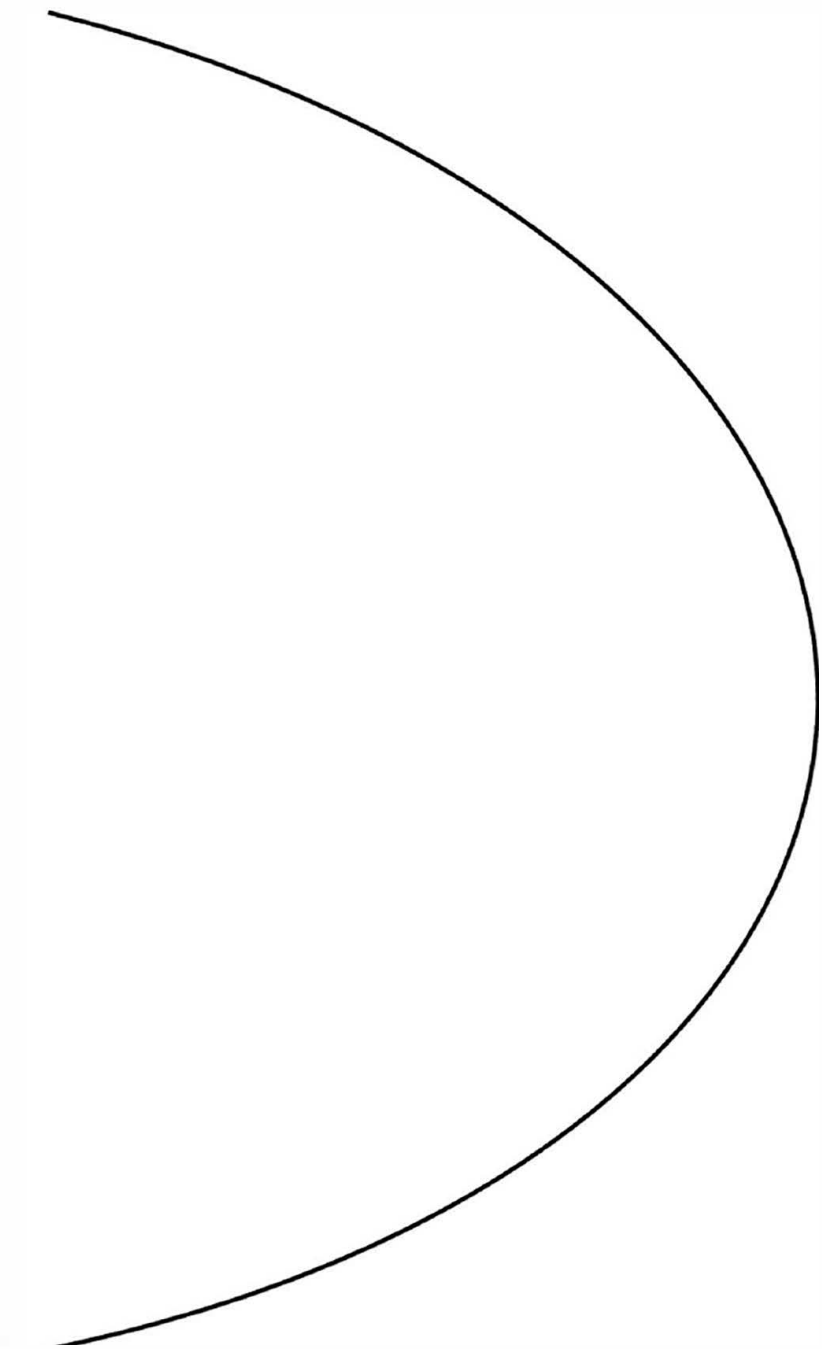
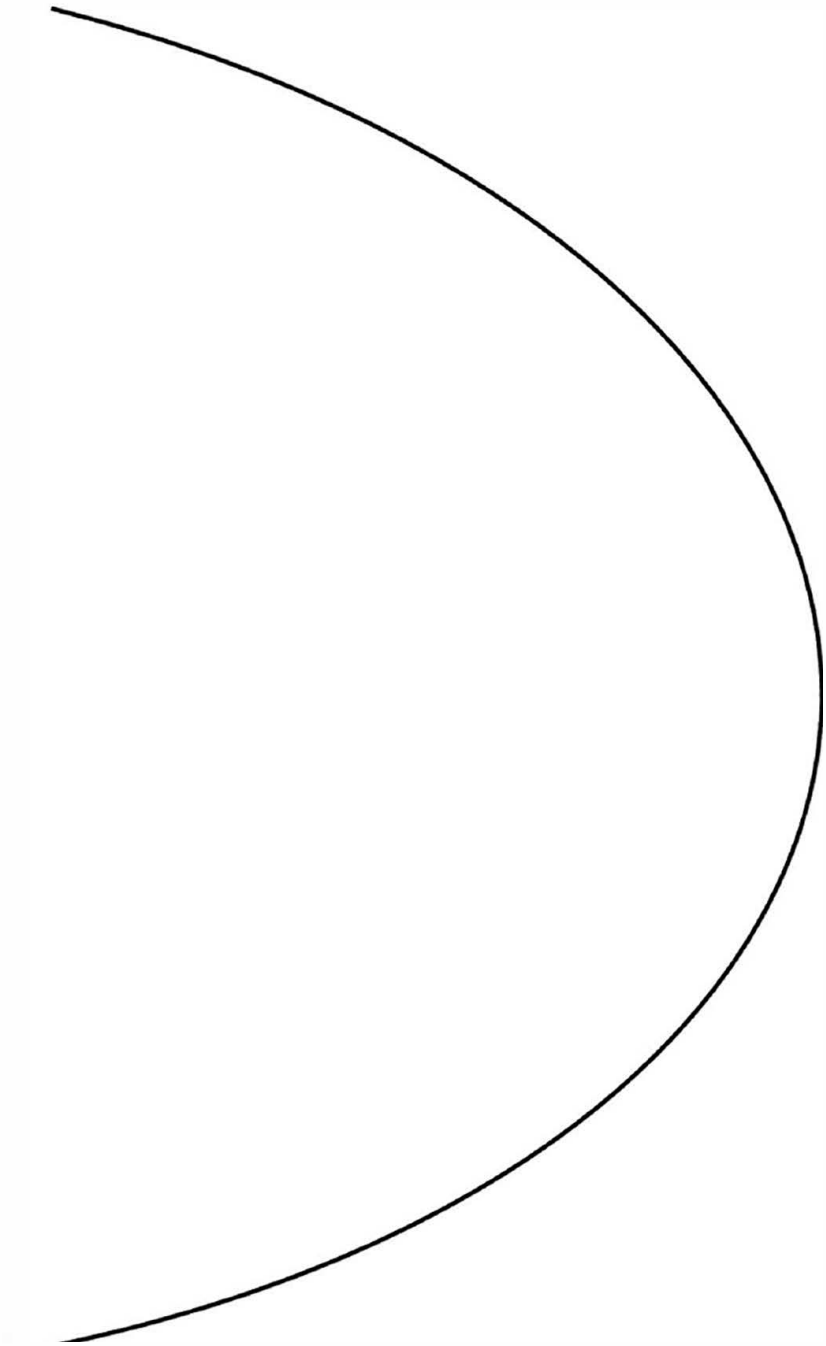
Conic Sections



Conic Sections



Specific angular momentum:

Energy:

semi-major axis

These equations are true for any Conic equation

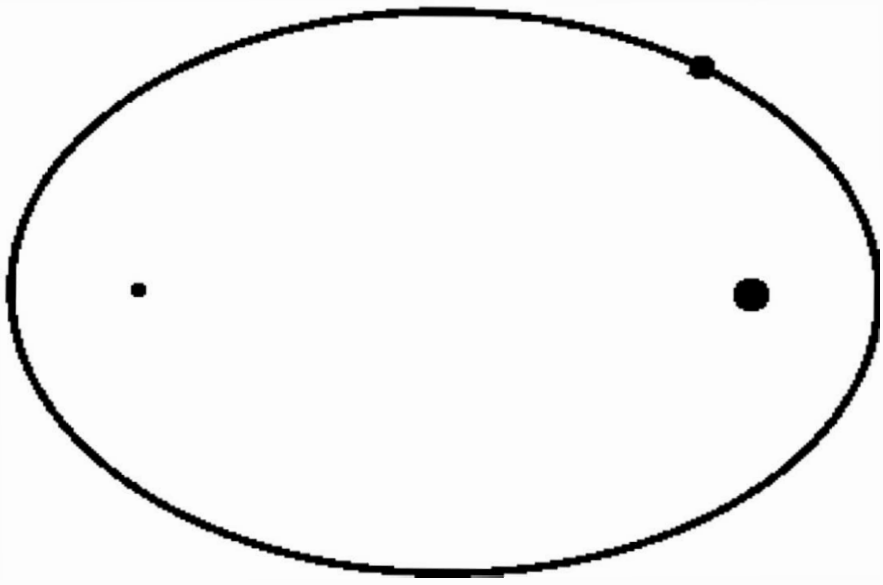
What's the relationship between $\hat{r}-\hat{\theta}$ + $\hat{e}-\hat{p}$?

$\hat{r}$ =

$\hat{\theta}$ =

Ellipse

$0 \leq e < 1, \quad a > 0, \quad \mathcal{E} < 0$



$$r = \frac{p}{1 + e\cos\theta^*}$$

Periapsis:

apoapsis

$a =$

Circle (Special case when $e = 0$)

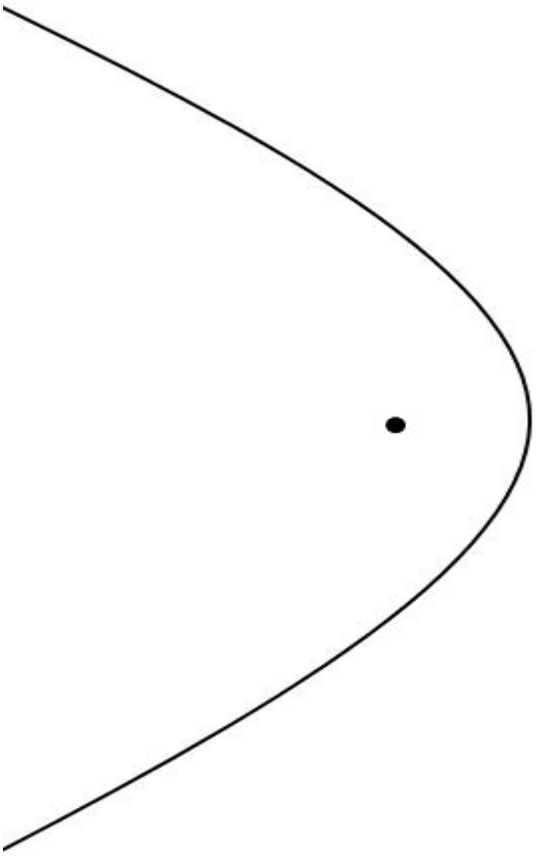
$a = r = p$

General Ellipse $r \neq a$

$$\frac{v^2}{2} - \frac{\mu}{r} = \underline{-\mu}$$

Parabola

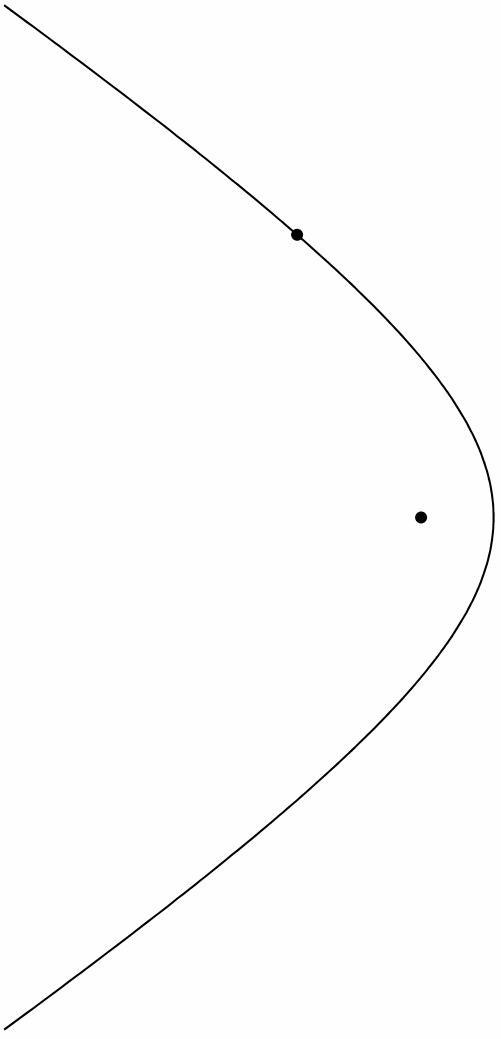
$e = 1 \quad a = \infty \quad \mathcal{E} = 0$



Find V_∞ at r_∞

Hyperbola

$e > 1, \quad a < 0, \quad \mathcal{E} > 0$



conic equation: $r = \frac{a(1-e^2)}{1+e\cos\theta^*}$

what is θ^*_∞ at r_∞?

$$\mathcal{E} = \frac{\mu}{2|a|} = \frac{v^2}{2} - \frac{\mu}{r}$$