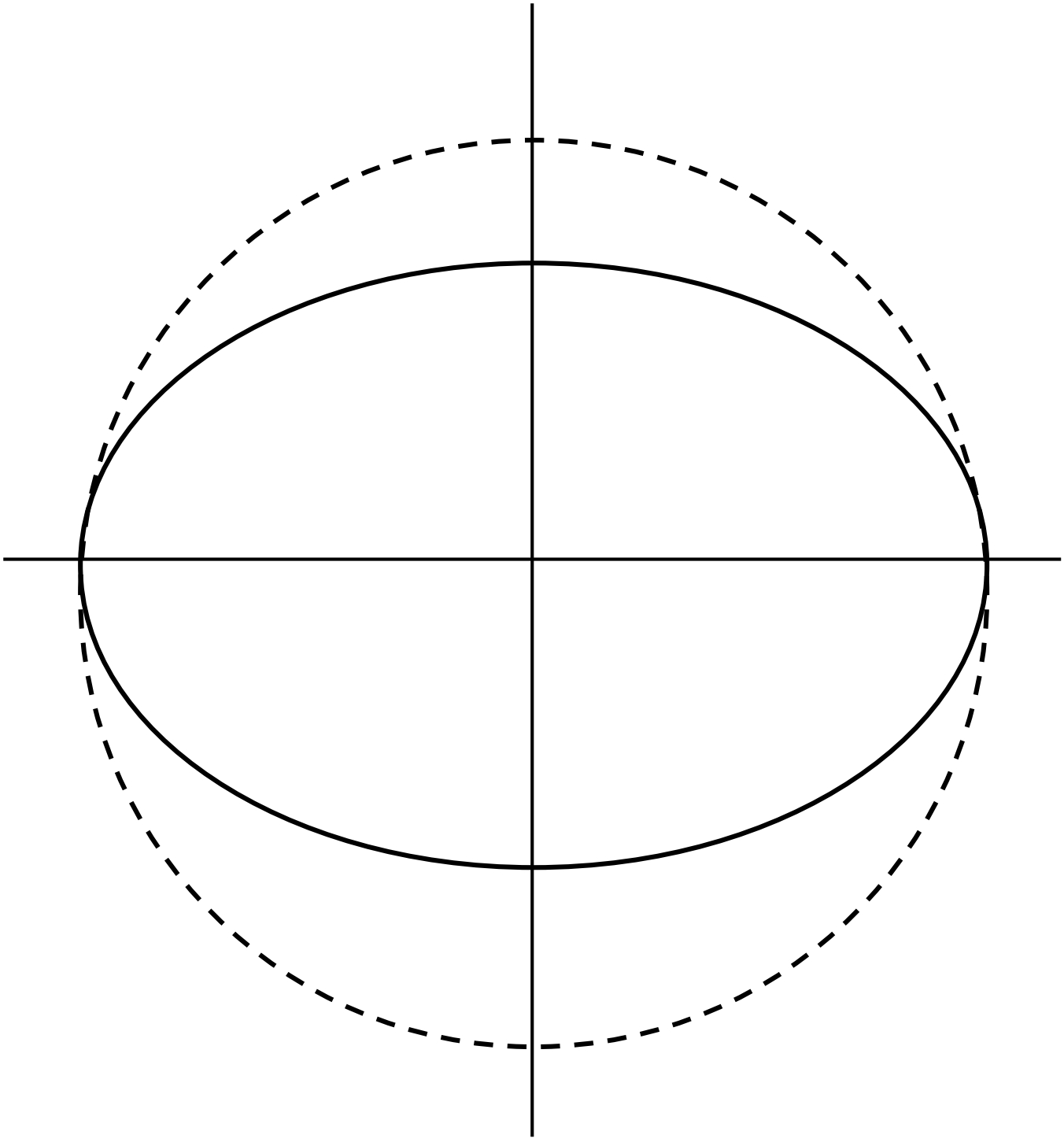
Eccentric Anomaly



How do we relate r, θ^* and E?

what is $ae - a\cos E$?

From conic equation, $\cos\theta^* = \frac{p}{re} - \frac{1}{e}$

Why do we really care about E?

Relate E to θ^* and t

Define $n = \sqrt{\frac{\mu}{a^3}}$

$$M = n(t - t_p)$$

For hyperbolic orbits

Note H can be negative since before periapsis $t - t_p < 0$

H is based on "equilateral hyperbola" where asymptotes are at equal angles.

For parabolas,

$$6\sqrt{\frac{\mu}{p^3}}\,(t - t_p) = \tan^3\frac{\theta^*}{2} + 3\tan\frac{\theta^*}{2}$$

Values that are constant for 2-body motion,

Change: