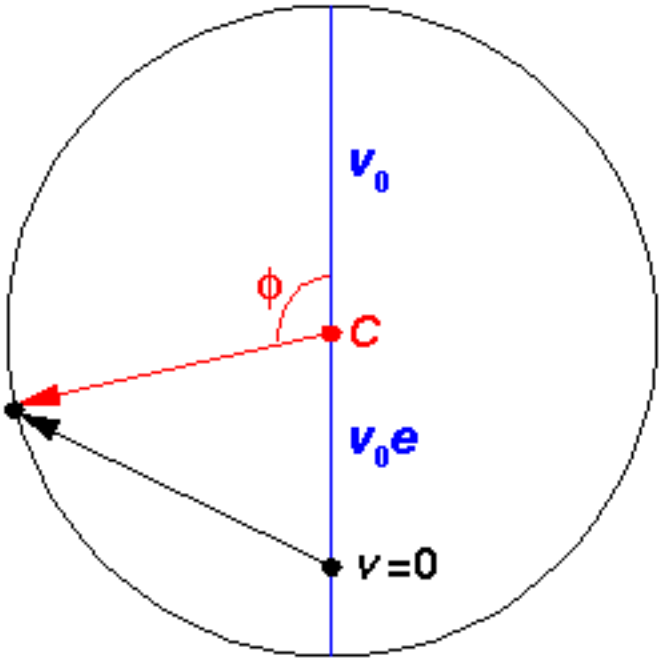
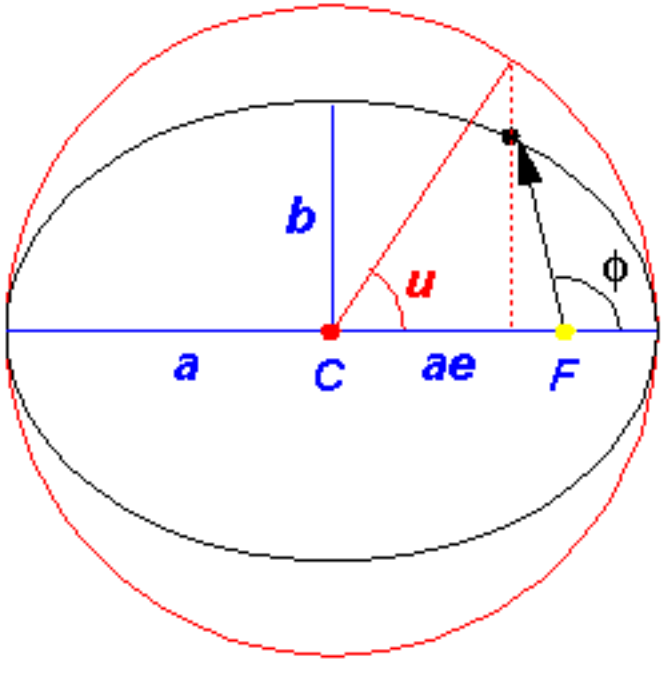


$$\tan\left(\frac{\phi}{2}\right) = \sqrt{\frac{1+e}{1-e}}\,\tan\left(\frac{u}{2}\right)$$

$$u - e\sin u = \omega t \qquad \text{where: } \omega = \sqrt{\frac{\alpha}{ma^3}}$$

$$r = a(1 - e\cos(u))$$

$$v_0 = \sqrt{\frac{\alpha}{ma(1-e^2)}}$$



$$r = \frac{a(1-e^2)}{(1+e\cos\phi)}$$

$$E = -\frac{\alpha}{2a}$$

$$L = \sqrt{\alpha m a(1-e^2)}$$

$$b = a\sqrt{1-e^2}$$