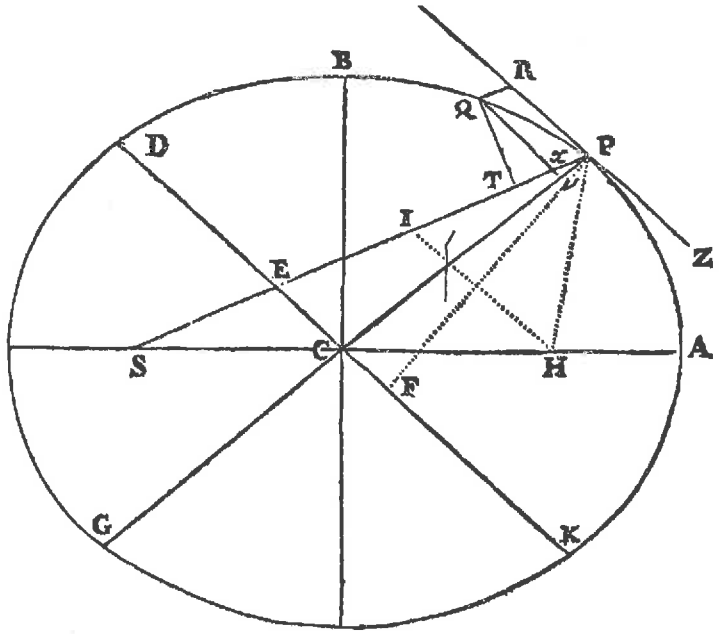
Problem 3. Proof for "Keplerian" Ellipse

Background (from Apollonius)

- $PV \times GV : QV^2$ as $PC^2 : CD^2$
- $QX : QT$ as $PE : PF$
- All circumscribed parallelograms equal in area: $4CD \times PF = 4CB \times CA$
- Latus rectum $L = 2BC^2/AC$



Outline of proof

- $EP = AC$ since $EP = (PS + PI)/2$
- $QR/PV = EP/PC$
- $QX^2/QT^2 = EP^2/PF^2$
- $\mathbf{L \times QR/QT^2 =}$
  $\mathbf{\{(AC \times L \times PC \times CD^2)/(GV \times CD^2 \times CB^2)\} \times (QV^2/QX^2)}$
  $\mathbf{= (2PC/GV) \times (QV^2/QX^2)} \Rightarrow$ unity
- So, $\mathbf{force \propto 1/(L \times SP^2)}$