

64 Philosophical Principles

Points at the *Vertex* common with the other Curve, and consequently $2 r \dot{x} - \dot{x}^2 = \dot{x}^m$, and $r = \frac{\dot{x}^m - \dot{x}^2}{2 \dot{x}} = \frac{\dot{x}^{m-1} + \dot{x}}{2}$. So then

if $m = 1$, the Curve becomes the *Appollonian Parabola*, and $r = \frac{\dot{x}^{1-1} + \dot{x}}{2} = \frac{1 + \dot{x}}{2}$,

but in this case $\dot{x}$ is infinitely small in respect of any finite quantity, and so is to be thrown away and r becomes $\frac{1}{2}$ i.e. The Radius of a Circle, that has the same degree of Curvature, with the *Appollonian Parabola*, is equal to one half of its *Latus rectum*. If $m > 1$,

then $r = \frac{\dot{x}^{m-1} + \dot{x}}{2} = 0$, for in that Case

$\dot{x}^{m-1}$ is infinitely small in respect of $\dot{x}$, and $\dot{x}$ is to be suppos'd 0, or infinitely small, when x is a flowing Quantity. Wherefore the Radius AD is infinitely small, or the Curvature of such Curves ABG , is infinitely great at the *Vertex*, in respect of the Curvature of the Circle, or between the Tangent AF , and the Curve AB ~~the~~ Circle can fall, If $m < 1$,

then $r = \frac{\dot{x}^{m-1} + \dot{x}}{2} = \infty$. For in that Case

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