

Reference: C:\Program Files\MathSoft\Mathcad 2001 Professional\steam\engines\StandardCrank\notes.mcd

$N := 360$     $i := 0..N$     $a_0 := 0$     $a_{100} := 360$     $a_i := \frac{a_{100} - a_0}{N} \cdot i + a_0$    Set up loop vallues. to chart down stroke through 180 degrees.

Engine Parameters:

Bore := 3

Stroke := 3

RodLength := 6

ValveArea := 0.64

$$R := \frac{\text{RodLength}}{\text{Stroke}}$$

RPM := 1800

$$\frac{\pi \cdot \text{Bore}^2}{4} = 11.0446616727766$$

Area ratio piston to steam passage flow area. (Valve opening)

$$\text{PistonSpeed}_i := \text{tor}\left(a_i \cdot \frac{\pi}{180}, R\right) \cdot \frac{2 \cdot \pi}{60} \cdot \text{RPM}$$

Inlet flow speed. The inlet flow speed is the flow velocity required to flow an equal volume of steam into the cylander as that transversed by the piston.

FlowFPS \* ValveArea = PistonArea \* PistonSpeed.

$$\text{Flow}_i := \text{PistonSpeed}_i \cdot \frac{\pi \cdot \text{Bore}^2}{4 \cdot \text{ValveArea}}$$

$$P_i := \text{pos}\left(a_i \cdot \frac{\pi}{180}, R\right)$$

