

```
> restart;
> p:=x->p0*L0^kappa/(L0-x)^kappa;
```

$$p := x \mapsto \frac{p0 \cdot L0^\kappa}{(L0 - x)^\kappa} \quad (1)$$

```
> V:=unapply(int(S*(p(x)-p0),x),x);
```

$$V := x \mapsto S \cdot \left(-\frac{p0 \cdot L0^\kappa \cdot (L0 - x)^{1-\kappa}}{1-\kappa} - p0 \cdot x \right) \quad (2)$$

```
> V(0)
```

$$-\frac{S p0 L0^\kappa L0^{1-\kappa}}{1-\kappa} \quad (3)$$

```
> m:=45e3; v0:=0.5; p0:=1e5; L0:=0.8; kappa:=1.4; S:=Pi*0.3^2/4;
m := 45000.
v0 := 0.5
p0 := 100000.
L0 := 0.8
kappa := 1.4
S := 0.07068583472 \quad (4)
```

```
> xz:=fsolve(1/2*m*v0^2+V(0)=V(xz),xz,0..L0);
xz := 0.5845957722 \quad (5)
```

```
> p(xz);
627725.9310 \quad (6)
```

```
> plot(p(x),x=0..L0*1,gridlines,axes=boxed,labels=[`x[m]`, `p(x)
[Pa]`])
```

