Kumari-Dass equation of state worksheet
Pressure:

```
unassign('lambd','B0','B0prime','density0');
```

$$pressure := density \rightarrow \frac{1}{lambd} \cdot \frac{\left(lambd \cdot B0 \cdot \left(\frac{density}{density0} \right)^{-lambd \cdot B0 + B0prime} + B0prime \right)}{lambd \cdot B0 + B0prime}$$

$$density \rightarrow \frac{lambd\ B0 \left(\frac{density}{density0} \right)^{-lambd\ B0 + B0prime} + B0prime}{lambd\ (lambd\ B0 + B0prime)} \tag{1}$$

dP drho:

```
diff ( pressure(density), density)
```

$$\frac{B0 \left(\frac{density}{density0} \right)^{-lambd\ B0 + B0prime} (-lambd\ B0 + B0prime)}{density\ (lambd\ B0 + B0prime)} \tag{2}$$

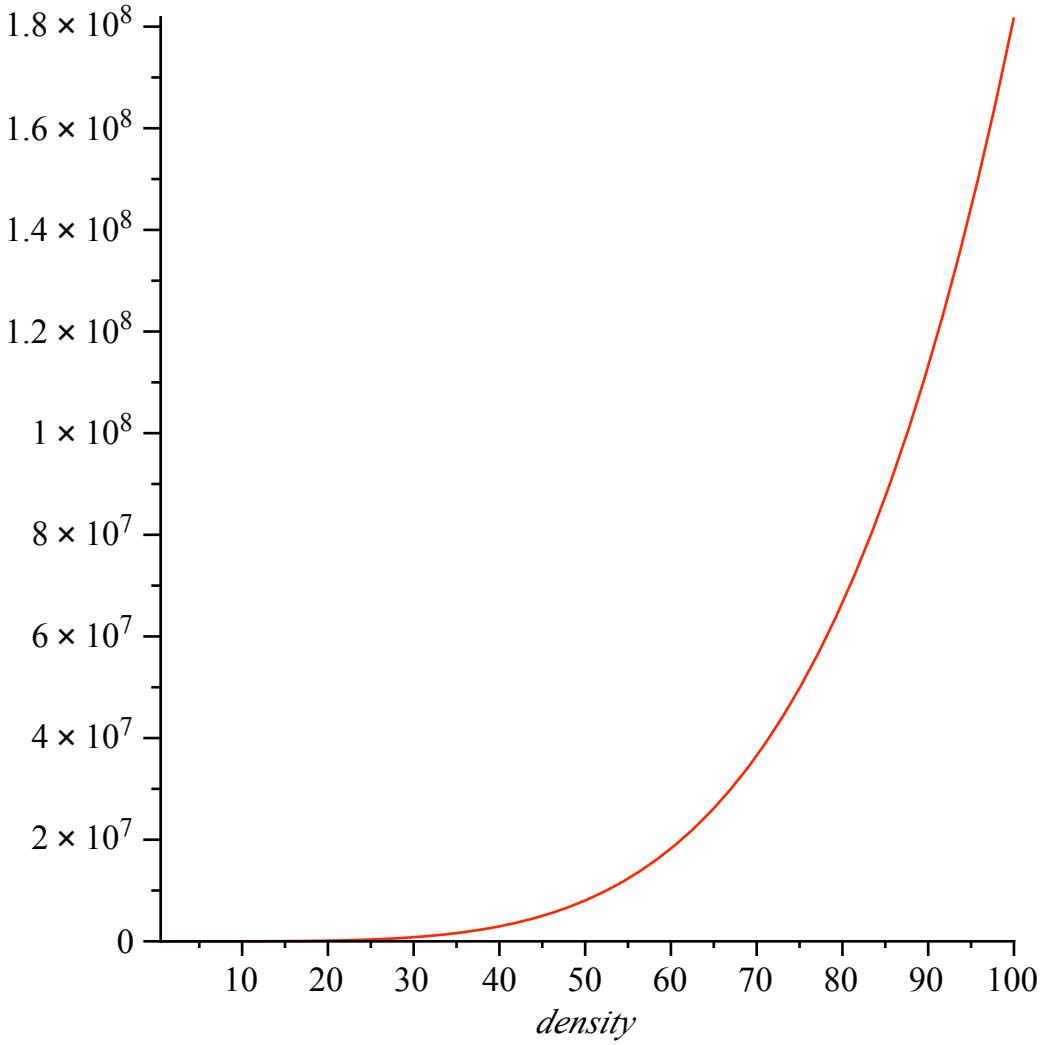
solution for density

```
solve( pressure(density), density)
```

$$e^{-\frac{\ln\left(-\frac{B0prime}{lambd\ B0} \right)}{lambd\ B0 - B0prime}}\ density0 \tag{3}$$

Test variables

```
lambd := 0.5 :
B0 := 1 :
B0prime := 5 :
density0 := 1 :
#Test Plots
plot( pressure(density), density=0.5 ..100.0)
```


1.8 × 10^8
1.6 × 10^8
1.4 × 10^8
1.2 × 10^8
1 × 10^8
8 × 10^7
6 × 10^7
4 × 10^7
2 × 10^7
0
10
20
30
40
50
60
70
80
90
100
density