```
> restart
```

(1)

```
> with(Physics) :
> μ = ρ[0];
```

$$\mu = \rho_0 \tag{2}$$

```
> ρ = μ(1 - (r/L)^2);
```

$$\rho = \mu\left(1 - \frac{r^2}{L^2}\right) \tag{3}$$

```
> μ = 450;
  L = 16;
```

$$\mu = 450$$
$$L = 16 \tag{4}$$

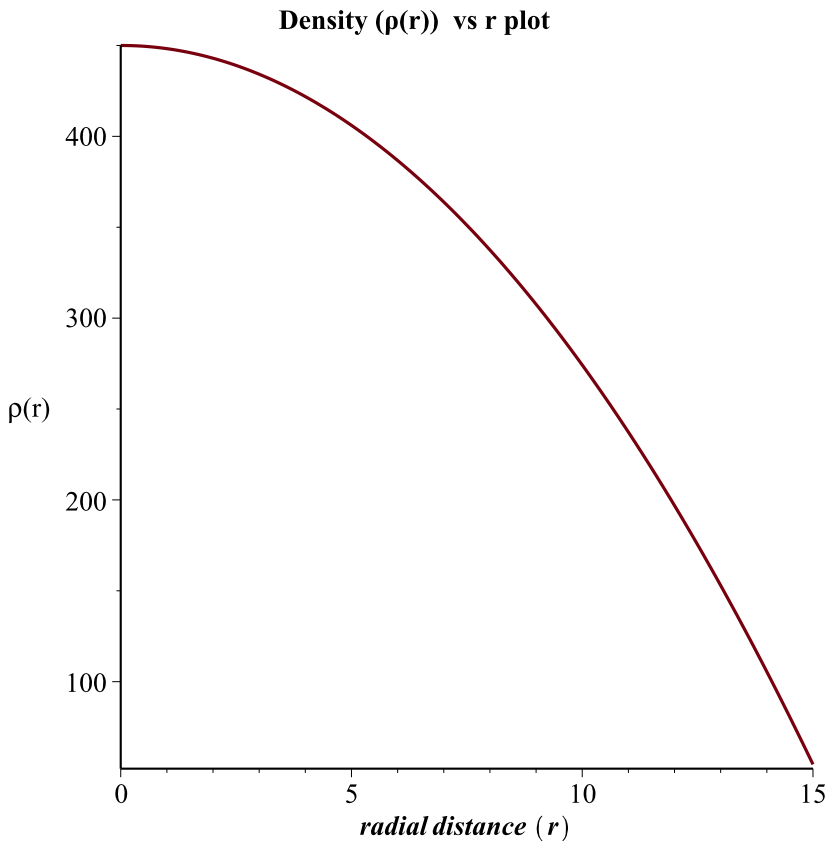
```
> ρ = 450(1 - (r/L)^2);
```

$$\rho = 450 - \frac{450\, r^2}{L^2} \tag{5}$$

```
> eval( (5), [L = 16]);
```

$$\rho = 450 - \frac{225}{128}\, r^2 \tag{6}$$

```
> plot(450 - (225/128) r^2, r = 0..15);
```



>

Equation of state

>

> $p = \frac{1}{3} \cdot (\rho - k);$

$$p = \frac{1}{3}\,\rho - \frac{1}{3}\,k \tag{7}$$

> $p = \frac{\left(450 - \frac{225}{128}\,r^2\right)}{3} - \frac{k}{3};$

$$p = 150 - \frac{75}{128}\,r^2 - \frac{1}{3}\,k \tag{8}$$

```
> eval( (8), [k = 225]);
```

$$p = 75 - \frac{75}{128}\,r^2 \tag{9}$$

```
> eval( (9), [p = 0]);
```

$$0 = 75 - \frac{75}{128}\,r^2 \tag{10}$$

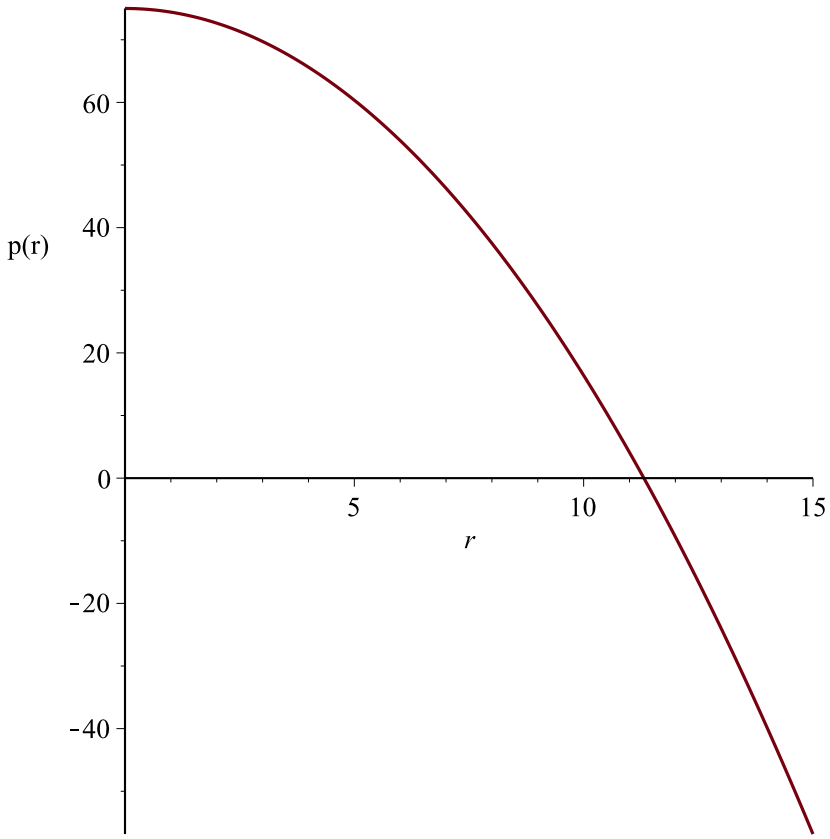
```
> solve( { (10) }, [r] );
```

$$[[r = 8\sqrt{2}], [r = -8\sqrt{2}]] \quad (11)$$

```
> solve( { (9) }, [r] );
```

$$\left[\left[r = \frac{8}{15}\sqrt{-6p + 450}\right], \left[r = -\frac{8}{15}\sqrt{-6p + 450}\right]\right] \quad (12)$$

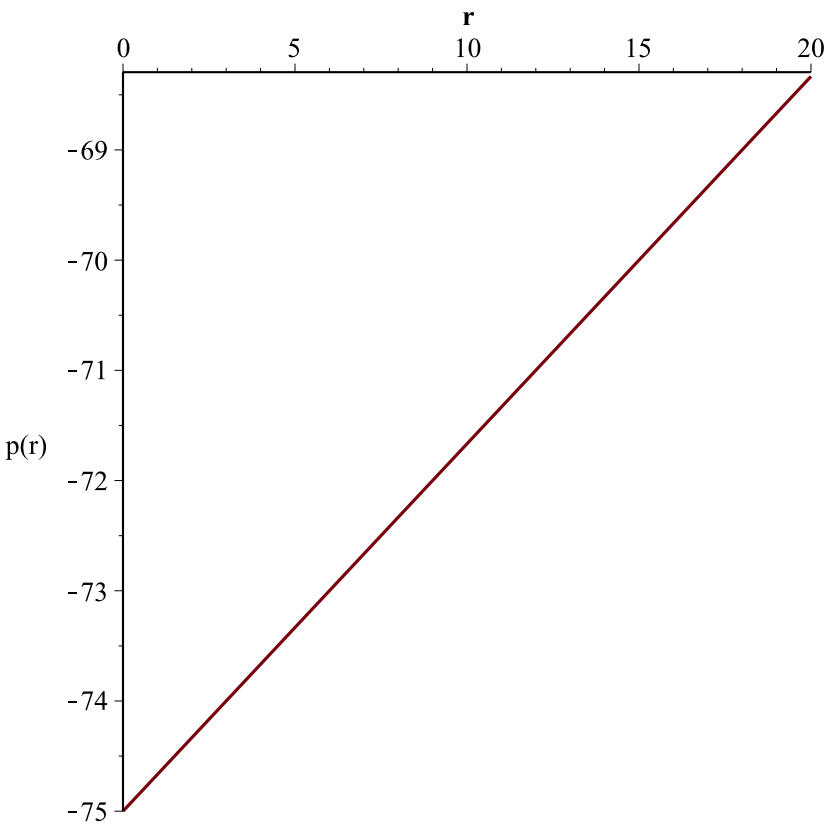
```
> plot(75 - 75/128 r^2, r = 0..15);
```




```
> p = ρ/3 - 225/3
```

$$p = \frac{1}{3}\rho - 75 \quad (13)$$

```
> plot(1/3 ρ - 75, ρ = 0..20);
```


r
0
5
10
15
20
-69
-70
-71
p(r)
-72
-73
-74
-75