```
> #Compute the surface area of a chopped off cone.
> restart;
> eq1:=L=sqrt(w^2+(R-r)^2);
```

$$eq1 := L = \sqrt{w^2 + R^2 - 2\,R\,r + r^2}$$

```
> eq2:=(2*Pi-theta)*rho=2*Pi*R;
```

$$eq2 := (2\,\pi - \theta)\,\rho = 2\,\pi\,R$$

```
> eq3:=(2*Pi-theta)*(rho-L)=2*Pi*r;
```

$$eq3 := (2\,\pi - \theta)\,(\rho - L) = 2\,\pi\,r$$

```
> A:=Pi*rho^2-theta/2*rho^2-(Pi*(rho-L)^2-theta/2*(rho-L)^2);
```

$$A := \pi\,\rho^2 - \frac{1}{2}\,\theta\,\rho^2 - \pi\,(\rho - L)^2 + \frac{1}{2}\,\theta\,(\rho - L)^2$$

```
> v:=solve({eq1,eq2,eq3},{rho,L,theta});
```

$$v := \left\{ L = \sqrt{w^2 + R^2 - 2\,R\,r + r^2},\ \rho = \frac{\sqrt{w^2 + R^2 - 2\,R\,r + r^2}\ R}{R - r},\ \theta = -\frac{2\,\pi\,(-\sqrt{w^2 + R^2 - 2\,R\,r + r^2} + R - r)}{\sqrt{w^2 + R^2 - 2\,R\,r + r^2}} \right\}$$

```
> A1:=subs(v,A);
```

$$A1 := \frac{\pi\,(w^2 + R^2 - 2\,R\,r + r^2)\,R^2}{(R - r)^2} + \frac{\pi\,(-\sqrt{w^2 + R^2 - 2\,R\,r + r^2} + R - r)\,\sqrt{w^2 + R^2 - 2\,R\,r + r^2}\ R^2}{(R - r)^2} - \pi\left(\frac{\sqrt{w^2 + R^2 - 2\,R\,r + r^2}\ R}{R - r} - \sqrt{w^2 + R^2 - 2\,R\,r + r^2}\right)^2 - \frac{1}{\sqrt{w^2 + R^2 - 2\,R\,r + r^2}}\left(\pi\,(-\sqrt{w^2 + R^2 - 2\,R\,r + r^2} + R - r)\left(\frac{\sqrt{w^2 + R^2 - 2\,R\,r + r^2}\ R}{R - r} - \sqrt{w^2 + R^2 - 2\,R\,r + r^2}\right)^2\right)$$

```
> simplify(A1);
```

$$\pi\,\sqrt{w^2 + R^2 - 2\,R\,r + r^2}\ (R + r)$$