```
> simplify(convert(1/(R - a*exp(-I*theta)) + exp(-I*theta)/(R*exp(-I*theta) - a), trig))
```

$$\frac{2\,(a\cos(\theta)-R)}{2\cos(\theta)\,R\,a-R^2-a^2} \tag{1}$$

```
> w2 := expand((U*(1 - R^2/z^2) - I*Gamma/(2*pi)*(1/(z - a) + R^2/(z^2*(R^2/z - a))) + I*B/(2*pi*z))^2)
```

$$w2 := -\frac{1}{4}\,\frac{\Gamma^2 R^4}{\pi^2 z^4\left(\frac{R^2}{z}-a\right)^2}+\frac{1}{2}\,\frac{\Gamma R^2 B}{\pi^2 z^3\left(\frac{R^2}{z}-a\right)}+\frac{I U R^2\Gamma}{z^2\pi\,(z-a)}+\frac{I U B}{\pi z}+\frac{U^2R^4}{z^4}$$
$$-\frac{2U^2R^2}{z^2}+U^2-\frac{I U\Gamma}{\pi\,(z-a)}-\frac{1}{4}\,\frac{B^2}{\pi^2 z^2}+\frac{1}{2}\,\frac{\Gamma B}{(z-a)\,\pi^2 z}-\frac{1}{4}\,\frac{\Gamma^2}{(z-a)^2\pi^2}$$
$$-\frac{I U\Gamma R^2}{\pi z^2\left(\frac{R^2}{z}-a\right)}+\frac{I U R^4\Gamma}{z^4\pi\left(\frac{R^2}{z}-a\right)}-\frac{I U R^2 B}{z^3\pi}-\frac{1}{2}\,\frac{\Gamma^2R^2}{(z-a)\,\pi^2 z^2\left(\frac{R^2}{z}-a\right)} \tag{2}$$

```
> simplify(evalc(Re(simplify(I/2*rho*2*pi*I*(residue(w2, z = 0) + residue(w2, z = R^2/a))))))
```

$$\frac{1}{2}\,\frac{\rho\,\Gamma\,(B\,R^2-B\,a^2-\Gamma\,R^2)}{a\,\pi\,(R^2-a^2)} \tag{3}$$

```
> simplify(evalc(Im(simplify(I/2*rho*2*pi*I*(residue(w2, z = 0) + residue(w2, z = R^2/a))))))
```

$$-\frac{(B\,a^2-\Gamma\,R^2)\,U\rho}{a^2} \tag{4}$$

```
>
```