L10WRS **Radius of curvature and Beam waist.**

1. Radius of curvature

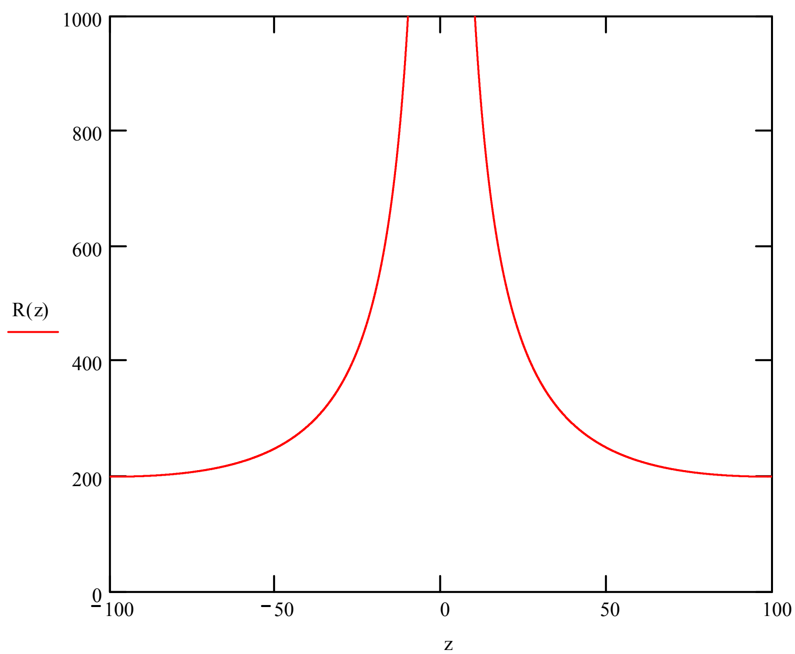
Beam waist normalized to 1 , that is we plot (w(z) =w0 SQR(1 + (z/zR)^2) and set w0 =.1, in cm. and zR = $\pi(\omega 0)2/\lambda - .01\pi/\lambda$, λ in cm.
Radius of curvature R(z) = z + (zR)^2/z

$$zR := 100 \qquad z := -100, -99.99 .. 100$$

$$R(z) := \left| z + \frac{zR^2}{z} \right|$$

Rm = 2zR

At z = 1/2 of distance of mirrors, that is
for for distance 200 at 100,
the radius of curvature must be
equal to the distance of the mirrors.



2. Beam waist

Plots of two branches of the beam waist and the Asymptote to w(z), that is y = z/zR

If z is in cm, we have set for w0=.1, λ=3.14*.01/zR in cm (about 3 microns for zR =100)

$$y(z) := \frac{z \cdot .1}{zR}$$

$$w(z) := .1 \cdot \sqrt{1 + \left(\frac{z}{zR}\right)^2}$$ and for the asymptote $$yy(z) := -y(z)$$

$$ww(z) := -.1 \cdot \sqrt{1 + \left(\frac{z}{zR}\right)^2}$$ and for the asymptote