In[•]:=
```
F = Pv π r^2 - Pl π r^2 - σ 2 π r == 0;
rVal = Solve[F, r][[2]][[1]][[2]]
```

Out[•]=

$$-\frac{2\,\sigma}{P_l - P_v}$$

In[•]:=
```
taylorSubstitution = {Pv → Pl + hfg / (Tsat vfg) (Tv - Tsat)};
rT = rVal /. taylorSubstitution
```

Out[•]=

$$\frac{2\,\sigma\,T_{sat}\,v_{fg}}{h_{fg}\,(-T_{sat} + T_v)}$$

In[•]:=
```
problem = {σ → 0.0589, hfg → 2257 × 10^3, vfg → 1.673, Tsat → 100, Tv → 102};
rT /. problem
```

Out[•]=

$$4.36596 \times 10^{-6}$$