w/ $\lambda = 1$. $\therefore$ we can take any constant function, let's choose $f = \frac{n}{2}$ and we get $(S^n, g, \frac{n}{2})$ as a shrinking gradient Ricci soliton.

The sol^n is $g(t) = (1-t)g$ which is defined for $t \in (-\infty, 1)$.

For $t < 1$, the metrics $g(t)$ have radius $r(t) = \sqrt{2(n-1)t}$.

③ Einstein manifolds

If (M^n, g, X, λ) is Einstein w/ $Ric = \frac{\lambda}{2} g$ then

$\mathcal{L}_X g = 0$ and X is Killing.

④ Topping–Yin nongradient Ricci soliton

Consider $\mathbb{R}^2$ w/ $g = \frac{2}{1+y^2}(dx^2 + dy^2)$ and $X = -x\frac{\partial}{\partial x} - y\frac{\partial}{\partial y}$.

Then $(\mathbb{R}^2, g, X, -1)$ is an expanding soliton.