rho in the example 1

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$$\begin{aligned}\rho(t) =& \frac{f(t)/\psi(t) - 1}{S(t)/S_x(t) - 1} = \frac{1/\psi(t) - 1}{\frac{1-t}{(1-t)^2} - 1} \\ =& \frac{1-t}{t}\frac{2C_0t^5 - 5C_0t^4 + 4C_0t^3 - C_0t^2 + 8t}{\Big((1-t)\Big(C_0(t-1)t^2(2t-1) + 8\Big)\Big)} \\ =& \frac{2C_0t^4 - 5C_0t^3 + 4C_0t^2 - C_0t + 8}{C_0t^2(t-1)(2t-1) + 8}\end{aligned}$$

Let's look at how the value varies.

```
rho1 = function(c,t){
  res1 = 2*c*t^4 - 5*c*t^3 + 4*c*t^2 -c*t + 8
  res2 = c*t^2*(t-1)*(2*t-1) + 8
  res = res1/res2
  return(res)
}
```

The range of the $\rho(t)$ value:

```
## [1] 0.9524 1.0500
```

For example, when $C_0 = 4$, the curve looks like